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HARD WORDS FROM A REAL FRIEND; HOOVER ON COMPETITION

Did you read the article entitled "Small Plants Visited on Trade Tour," which appeared in last week's issue of TELEPHONY?

One subscriber who read it makes this comment: "At first I was inclined to be indignant, as I thought it was a pretty hard slam on the telephone business, but the more I thought it over, the clearer I saw the point the writer had in mind, and I guess he's about right."

This will be gratifying to the individual who wrote the article—signing it "Observing Traveler"—who is one of the leading Independent telephone managers in a Middle Western state, a man whose name would add considerable weight to any opinions or views relating to the telephone business.

He was obliged to withhold his name for the very obvious reason that otherwise he could not tell his story without great embarrassment to other telephone men in his own state. As he admitted, it was not a pleasant story to tell, but for the sake of others who might be helped and influenced to turn over a new leaf, he fell to with his ax—or hammer—and let the chips and hard words fall where they might.

* * * *

His criticisms will do a lot of good if telephone associations and the live operating companies in every state and district see to it that "Observing Traveler's" story is placed on the desk of every manager who is falling down on the job, as he described.

The writer of the article in question was invited to join a delegation of bankers which visited 40 towns in his state, calling on the various classes of business men and inspecting conditions. Too many times he found the local telephone company tucked away in poor quarters, struggling along under inadequate rates, and generally laboring under conditions that, if applied to a bank, a dry goods store, grocery, garage or any other business, would mean certain failure.

What he argued for was that the local telephone man is in just as important and vital a business as the banker or the merchant, and should be as proud of his job and command as much respect as anybody.

The telephone companies which took that attitude were found to be enterprising and successful. They knew they were serving the public well and they got recognition. On the other hand, the companies that lacked the spirit to demand their due, that stayed in the rut and marked time rather than assert themselves, were found to rate low among the community's industries.

* * * *

A representative telephone man, proud of the telephone business, the discoveries which "Observing Traveler" made on this tour of his state so stirred him up that when he came to write the article, he did not mince matters a bit. The old proverb says, "Faithful are the wounds of a friend," and it was in this spirit—hoping that some telephone men would be jarred out of their rut—that he recorded his impressions.

There is sound sense in the conclusion he reached, after digesting the information obtained on his trip. Read it again:

"I see no reason why the average telephone man need not hold his head as high as the average banker, nor why his social and business standing should not be as great or greater than that of the successful merchant in his own home town.

What is needed to bring this standing is nothing more than the application of ordinary up-to-date business methods, such as are used by the merchant, the garage man or the real estate dealer.

First of all, equipment and service should be placed in good condition. Don't be continually making excuses; instead, make good. Clean up and paint up the office. Put up signs so the public will know where you are and who you are. Advertise judiciously. Tell the public your problems, your aims and your ambitions.

Be proud of your business and make it one your community will be proud of. Let the public know your business is as essential as that of the banker, and make your services indispensable.

You may then take your rightful place in the community, and no one but yourself can remove you from it."

* * * *

It is worthy of notice that the successful telephone managers were found to be the ones who regularly attended telephone conventions, read their trade journals and

overlooked no chance to keep posted on developments in their work.

Isn't it queer how it is always the down-at-the-heel concern which never finds time—or energy—to do the things that lead to efficiency, economy and success?

* * * *

There is a similar thought—and a good one—in the letter sent out by the Illinois Telephone Association urging attendance at one of its district meetings. Here's the way Secretary Jay G. Mitchell phrased it:

"Of course, you are busy. The management of a successful telephone company under present conditions requires the closest supervision. The service must be continued without interruption and the trouble must be promptly and completely cleared.

Can anything be more *important,* though, than the consideration and solution of those problems which are common to the telephone industry as a whole?

The public that you serve, your stockholders, your employes, and your connecting companies are entitled to the advantage of every method that can be employed to improve service, increase revenues, better working conditions and establish satisfactory and pleasant relations with the public.

Should it not be considered as a part of *your* job, therefore, that you and your department heads, with as many operators as can be spared from furnishing service, attend the district convention of the Illinois Telephone Association at Danville?"

* * * *

Business men generally get something worth while when they listen to an address from Herbert Hoover, Secretary of Commerce. In his speech before the convention of the United States Chamber of Commerce, Secretary Hoover emphasized the necessity of the right kind of competition in all industry.

In the utility field, he said, there are "regional monopolies," due to the desirability of eliminating duplicate services, but Mr. Hoover made it plain that essential competition must always be maintained in industry if the country is to progress.

"I am one who believes strongly that full constructive competition must be preserved in the manufacture and distribution of commodities," Mr. Hoover said. "The virility and strength of our whole economic system springs from spontaneous enterprise and the stimulation of competition. It is the impulse of invention and improvement. But competition does not necessarily imply destructive competition. It does imply that we must maintain a sufficient number of independent units in any given industry to assure us that the fundamental competition is sustained.

"Obviously, we do not want units so big or controls so wide that they become a menace to the public or destroy individual initiative. The essential question, after all, is whether the unit is subjected to effective competition."

* * * *

There is food for thought in that quotation for those who are handling the relations between the Independent and Bell groups in the telephone industry. Mr. Hoover has re-stated forcefully a principle that Americans are always eager to uphold—the principle of no monopoly.

COMING CONVENTIONS.

Georgia, Atlanta, Henry Grady Hotel, May 26, 27 and 28.

Wisconsin, Madison, Loraine Hotel, June 9, 10 and 11.

Pennsylvania, Philadelphia, Bellevue-Stratford Hotel, August 30, 31 and September 1.

United States Independent Telephone Association, Chicago, Hotel Sherman, October 12-15.

Transmission in Subscribers' Loops

Discussion on Transmission Equivalents of Subscribers' Loops as Applied to Zoning in Common Battery Manual No. 1 and No. 10 Board Areas—Factors in Fixing Areas in Which Different Types of Instruments Should Be Used

By W. D. Lapin,
Central Plant Department, Bell Telephone Co. of Canada, Toronto.

The purpose of any plant design data is to provide a basis for economical plant design from a transmission standpoint, giving standard transmission throughout the system. For this purpose it is necessary to provide data on the transmission equivalents at talking frequencies of lines and equipment most commonly used in telephone plant.

A subscriber's loop, including the instrument, is graded according to the sum of the transmitting plus receiving losses (T and R losses). These depend not only on the reflection losses and the line transmission equivalent of the loop, but also upon the efficiencies of the transmitter, receiver and inductive coil.

There are now in use in the plant, or available for use, various types of subscribers' instruments which differ considerably in transmission efficiency. The latest instruments are considered more efficient than the original No. 229 transmitter, No. 122 receiver and No. 20 induction coil set, which was considered as standard for many years.

It is the purpose here to discuss the factors involved in fixing the areas or zones in which the different types of subscribers' instruments should be used so as to obtain the greatest economies in outside plant.

Instrument Efficiencies.

In order to take advantage of the instrument gains which are now made available by the use of the No. 337 transmitter, the No. 144 receiver and the No. 46 induction coil, and to obtain the maximum economies through the use of small-gauge cables made possible by these gains, it has been found desirable and economical in many cases to discriminate in the use of instruments of different efficiencies. We are now in receipt of information that a transmitter (No. 337) for use on subscribers' instruments has been adopted, which will, due to increased transmission efficiency, permit the use of a larger percentage of small-gauge cable in the cable plant.

The gain in transmission efficiency which is given by this latest substation apparatus has resulted in a number of improvements in the economical design of the local plant. Chief among these is the extensive use of the No. 24 gauge cable. Hitherto it was found with the substation set then in use that No. 24 gauge cables could not be extended to any appreciable length from the central office without excessive trans-

mission losses being incurred, but with the new sets it has become possible to greatly extend these lengths.

It must not be assumed, however, that the total gain given by these sets is used up in extending the loops alone without any reference being made to any other of the plant elements, such as inter-office trunks and toll switching trunks. As a matter of fact, they are taken into account, for according to the latest practice the different offices in an exchange are each given what is known as a "Limit in Transmission Units" (T. U.), this T. U. being determined by a loop and trunk study of the exchange area.

Consequently, for all intents and purposes herein, it can be assumed that a limiting T. U. has been assigned to every office, in either a single office or multi-office area.

Standardization of the T. U.

It has been the practice in the Bell system to use the "Mile of Standard Cable" as the unit in which to express transmission losses in telephone circuits and apparatus. It has been decided for the reasons already discussed to standardize the use of another unit for this purpose. The new unit, as has been mentioned, has been designated the "Transmission Unit" and will be abbreviated T. U.

This new unit is used in the same way as the "Mile of Standard Cable" to express the transmission equivalents of circuits and the losses or gains caused by changes or insertions of apparatus in the circuits. The new unit differs principally from the "Mile of Standard Cable" in that it represents the same loss for all frequencies; that is, it is distortionless.

Two amounts of power differ by one T. U. when they are in the ratio of $10^{0.1}$, and any two amounts of power differ by "N" T. U. when they are in the ratio $10^{N(.1)}$. In accordance with this definition, the number of T. U. corresponding to the ratio of any two powers, $P1$ and $P2$, is the common logarithm of the ratio $P1/P2$ divided by 0.1. This may be written $N = 10 \log 10\ P1/P2$.

As applied to telephone transmission this means, for example, that in a uniform distortionless line, the ratio of the amount of power at a point B to the power at a point A is $10^{0.1}$, and if the point A is nearer the source of power than the point B, this ratio becomes $10^{-0.1} = 0.794$, when the points are separated by a length of line whose transmission equivalent is one T. U.

As an aid in forming a conception of the magnitude of the T. U., it should be noted that one mile of standard cable has an equivalent of one T. U. at 890 cycles.

A mile of standard cable gives different power ratios with different frequencies, while the T. U. gives the same loss or power ratio at all frequencies.

The transmission efficiency of a complete telephone circuit, as measured in T. U., is expressed in terms of the Transmission Reference System. The Transmission Reference System consists of a transmitting element, an adjustable line and a receiving element.

The Transmission Reference System

This line is distortionless in T. U. The transmitting and receiving elements are so designed that they can be reconstructed from specifications to give the standard volume. They, as well as the line, are practically distortionless, and their efficiency is such that the volume reproduction ratio of the system with 24 T. U. in the line is the same as that of the Standard Reference System described in the Transmission Bulletin of 1912 with 24 miles of standard cable.

Two transmission systems are said to have the same volume reproduction ratio when for the same speech input to the transmitting elements, the volume of speech output from the receiving elements of the two systems as perceived by the ear is the same.

Reasons for Adoption of the T. U.

Since the attenuation caused by a standard cable varies with frequency, the "mile of standard cable" involves both a change in volume of the transmitted telephonic currents and also a distortion of these currents, therefore the different single frequency components are transmitted with non-uniform efficiency. The distortion of standard cable is fairly typical of many telephone circuits and was a satisfactory unit with which to measure transmission when this was done by voice tests.

The use of voice testing in the field, however, has been practically given up, and it is now the general practice to determine the efficiency of telephone circuits on the basis of single frequency measurements or computations. The standard cable mile is not a convenient unit of comparison for this use as it varies with frequency. As a result, there has grown up the practice of expressing transmission efficiencies in terms of the attenuation of standard cable for a particular frequency, namely, the 800-cycle mile.

In proposing the replacement of the "mile of standard cable" by another unit, this 800-cycle mile was considered for the new standard. It has been found, however, that this unit has not the physical significance that it was supposed to have, since with present apparatus, the attenuation of the standard cable for the complex currents corresponding to speech sounds, is more nearly equivalent to the single frequency attenuation at 1,000 cycles than at 800 cycles. Moreover, this equivalent varies with the type and over-all efficiency of the circuit and with the type of terminal apparatus used.

The advantage of a unit of transmission efficiency which is independent of frequency has been recognized in the use of the "800-cycle mile" as referred to. In expressing the efficiency of carrier or radio currents, such a distortionless unit is particularly desirable. The T. U. is approximately equal in effect on volume to a "mile of standard cable." This reason is largely a practical one so as to avoid changing materially the conception which has been built up regarding the magnitude of such things as transmission service standards.

A consideration of the foregoing qualifications and of the various units suggested led to the proposal of the power ratio of $10^{0.1}$ as the most suitable ratio on which to base the unit of transmission efficiency. In view of the favorable reception of the change to this unit, it has been decided to adopt this unit as the standard for the Bell system and that its use will replace that of the "mile of standard cable" for the expression of all transmission equivalents, losses or gains.

Zoning Plan.

The basis of any zoning plan must necessarily be the transmitting efficiency of the limiting loop of the particular zone office in question. The limiting loop is determined on the basis of using the highest efficiency instruments in the limiting loop. This generally leads to a design of plant permitting greater use of smaller gauges of cable than heretofore in either trunks or loops, or both. The zoning plan is to install No. 337 transmitters in the zones where maximum economy will result.

From any central office outwards there are successive sections within which the No. 329 and No. 323 transmitters on No. 24 gauge loops will give a transmitting plus receiving loss not exceeding the limit assigned that office in T. U. No saving of cable would result from installing No. 337 transmitters in these sections.

Outside of points where a No. 323 transmitter gives a T and R loss on No. 24 gauge cable equal to the office limit, the No. 337 transmitter may be used to advantage. The outside limit for the installation of No. 337 transmitters is the point where, on account of excessive T and R losses, local battery sets must be resorted to. The routine installation of No. 337 transmitters is based on the transmission requirements of the loops on a future No. 24 gauge cable basis, regardless of the fact that with existing No. 19 and No. 22 gauge cable, the No. 323 transmitter gives T and R equivalents not exceeding the office limit.

The gauge of existing cables is taken into account where the No. 337 transmitter would receive too much current and would fry or burn. These transmitters may not be installed inside the burning limit shown on the accompanying diagram, as "Burning Limit of No. 337 Transmitters," because within this limit the No. 337 transmitter would receive more than 70 milliamperes of current.

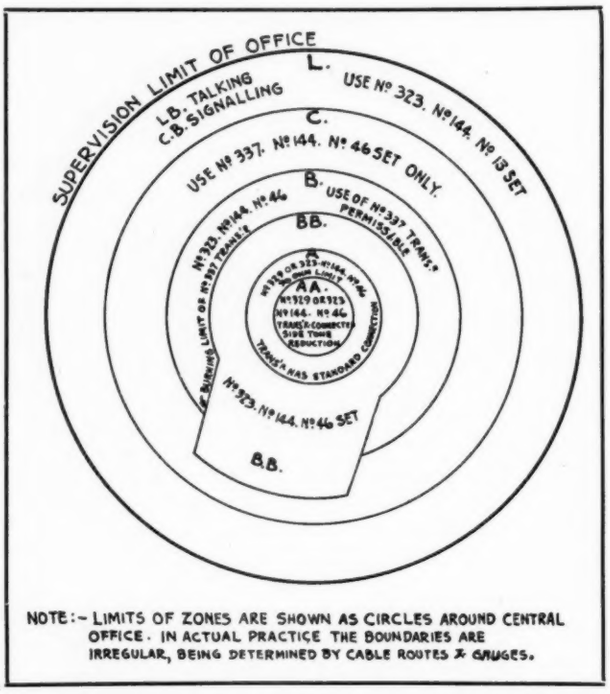
Computing of Zones.

The zones in which the various types of instruments may be used should be computed on the basis of the T and R loss on No. 24 gauge cable with the instruments in

question. These total losses should not in any case exceed the total transmitting plus receiving losses of the limiting loop in the same office area equipped with the highest efficiency instruments.

Although in general the burning limit for the No. 337 transmitter in manual 24-volt offices is 250 ohms, there is some possibility that this may be still further reduced. For this reason, it is preferable, in the cases of the shorter limiting loops where the inner limit of zone *C*, in the diagram, falls within the 250-ohm limit, to use the No. 337 transmitter down to the point where the current through the transmitter will not exceed 70 milliamperes (0.070 ampere) on local connections, rather than set up a separate zone to take care of this area.

With reference to the burning limit of the No. 337 transmitter, it is suggested that for the present this instrument should in general be used on loops which will allow a current of less than 60 milliamperes flowing through it on local connections. As has been pointed out, this may be increased to 70 milliamperes in special cases where an increase is justified.


SUPERVISION LIMIT OF OFFICE
L.
L.B. TALKING
C.B. SIGNALLING
USE Nº 323. Nº 144. Nº 13 SET
C.
USE Nº 337. Nº 144. Nº 46 SET ONLY.
B.
USE OF Nº 337 TRANS.? PERMISSIBLE
BB.
A.
AA.
Nº 329 OR 323
Nº 144. Nº 46
TRANS'R CONNECTED SIDE TONE REDUCTION
TRANS'R HAS STANDARD CONNECTION
Nº 323. Nº 144. Nº 46 SET
BB.
NOTE:- LIMITS OF ZONES ARE SHOWN AS CIRCLES AROUND CENTRAL OFFICE. IN ACTUAL PRACTICE THE BOUNDARIES ARE IRREGULAR, BEING DETERMINED BY CABLE ROUTES & GAUGES.

Transmission Zone Diagram, Indicating Types of Instruments Required on New Installations or Replacements of Exchange Line Stations in Common Battery Central Offices.

As subscribers' sets employing No. 337 transmitters are higher in efficiency than other types of sets, it is obvious that the use of No. 323 and No 329 transmitters should be confined to areas closer to the central office. Drawings are made up which will show, for any designated limiting loop, the zones in which subscribers' instruments of different efficiencies are required for transmission reasons, and also where the No. 337 transmitter may not be used for other reasons.

Theoretically, local battery sets should be employed between the outer limit of zone *C* and the supervision limit of the office, but practically it appears reasonable to allow a tolerance for one T. U. for common battery before installing local battery sets. This is due to the fact that excess maintenance costs for local battery sets are approximately equal the value of the transmission gain effected by their use at this point on the average limiting loop.

Where the limiting loops of offices were formerly set in ohms, they are now set in T. U.

On the longest loops, advantage also may be taken of the inherent characteristics of local battery subscribers' sets. If the loop is in an area served by a common battery office, local battery sets may be used for supply current to the transmitter and common battery signaling. In this case, the transmission efficiency of the loop may be calculated in the same way as for local battery loops.

When local battery sets are used on common battery loops, care should be taken to insure that the receiver is properly poled, as otherwise considerable loss in receiving efficiency may result since the direct current from the office battery flows through the receiver at the substation.

The zones from the central office outwards, as shown on the accompanying transmission zone diagram, are respectively, zones *A*, *B* and *C*. Zones *A* and *B* have subdivisions coded *AA* and *BB*.

Zones for Common Battery Manual No. 1 and No. 10 Board Areas.

Zone *A* includes the area fed by terminals which are less than a given distance from the main frame measured along the sheath or cable route to the terminals. This distance is a length set by the point at which a "329-144-20 set" would give a T + R loss equal to the office limit in T. U. when No. 24 gauge cable replaces existing cable.

Zone *B* includes the area outside of zone *A* fed by terminals which are less than a given distance from the main frame measured along the sheath or cable route to the terminal. This distance is a length set by the point at which the "323-144-46 set" would give a T + R loss equal to the office limit in T. U. when No. 24 gauge cable replaces existing cable.

Zone *C* includes the area outside of zone *B* out to the boundary or outside limit where it is necessary to provide local battery talking for transmission. From the inner edge of zone *C* the No. 337 transmitter on No. 24 gauge cable will give transmission equivalents less than the office limit out to the point where the T + R loss on No. 24 gauge becomes equal to the office limit. Past the point where the loss on a loop all of No. 24 gauge equals the office limit, combinations of No. 24 and No. 22 gauge or No. 24 and No. 19 gauge cables are necessary.

Where, with existing cable, a T + R loss equal to or less than the office limit cannot be obtained with the No. 337 transmitter, local battery talking should be used as previously referred to. In practice, the loss may be allowed to exceed the office limit by one T. U. before the increased maintenance expense of a local battery talking set is warranted.

In no case should a loop exceed the "supervision limit" of the office without providing long haul signaling apparatus. The transmission loss introduced by this apparatus must be taken into account; but the sum of the T and R losses should still be maintained within the office limit.

Zone *AA* is a subdivision of zone *A* and includes the area fed by terminals from which the loop resistance to the main frame would be less than 90 ohms on existing cable at any time. Within this zone the transmitter should be connected side-tone reduction.

Zone *BB* is a sudivision and zone *B* and includes the area outside of zone *A* fed by terminals from which the loop resistance measured to the main frame would be less than 250 ohms on the existing cable at any time. In zone *BB*, the No. 337 transmitter, if used, would receive sufficient current to fry or burn.

Variation of Zone Limits.

As the outer limits of zones *A* and *B* are computed on the basis of No. 24 gauge cable, they do not vary with cable cuts unless these change the loop length from main frame to subscriber's terminal.

The limits of zone *AA* for side-tone reduction connection of the No. 329 or No. 323 transmitter, and zone *BB* eliminating the No. 337 transmitter on account of burning, depend on the resistance of existing cable. The areas affected by these limitations naturally change with cable changes.

Thus, from the foregoing, we have seen that the problem of subscribers' loop distribution is rendered increasingly difficult with growth in the plant where duct congestion already exists. With No. 24 gauge cable more pairs may be used in a given space than with No. 22 or No. 19 gauge. The No. 24 gauge also costs less than either of the others. Obviously a considerable reduction in annual charges results from its general use, with the consequent saving in duct space and initial cost. A large proportion of the subscribers' loop

plant may be No. 24 gauge cable with the general introduction of No. 337 transmitters, the superior transmitting efficiency of which permits the change to small-gauge cable without lowering the grade of transmission given.

The zoning plan is to install No. 337

Zone.	Trans-mitter.	Alternative transmitter per-missible.	Re-ceiver.	Induc-tion coil.
AA	323*	329*	144*	46*
A	323	329	144	46
BB	323	None	144	46
B	323	337	144	46
C	337†	None	144	46

*In zone *AA*, the No. 329 or No. 323 transmitter must be connected for side-tone reduction.

†In zone *C*, equip very long lines with No. 323 transmitter on local battery; that is, past the outer boundary of zone *C*, local battery sets with common battery supervision are required. In zone *B*, No. 337 transmitters are permitted if they will not burn.

N. B.—Because of the difference in existing facilities and the future, No. 24 gauge cable expected, zone *BB* in places may extend farther geographically than the limit of zone *B*. As the cable is changed, the outer limit of zone *BB* will move in towards the office uncovering an area which otherwise would have been in zone *C*. When such a change takes place, replacements of No. 323 transmitters with No. 337 transmitters should take place in the area, changing from zone *BB* to zone *C*.

Subscribers' Sets for Zones in No. 1 and No. 10 Board Areas.

transmitters in the bands or zones where maximum economy will result as outlined.

It should be emphasized that the zoning information shown on the assignment maps should consist at all times of the zoning which is to be applied *currently* to routine installation work. The general plan in regard to the engineering determination of the areas to be included in the different zones is that the zones established for current routine installation work are to conform to the ultimate to the extent practicable, but there will be cases where the ultimate zoning cannot be currently applied.

The most common of these are: (1) The numerous cases where the limits of the anti side-tone (90 ohm) zone will be changed by changes in cable feeds; and (2) cases where the present cable feeds preclude the present use (because of the "burning" feature) of No. 337 transmitters in an area which will ultimately be included in zone *C*. In such cases the assignment maps will indicate the current zoning and not the ultimate.

The foregoing methods of zoning subscribers' instruments apply primarily to exchange circuits. This article should prove of interest and value in forming ideas of transmission equivalents as a whole, and of the relation between the old "mile of standard cable" and the T. U.

Correspondence Course in Toll Operating of National Association.

Hundreds of operators have enrolled in the correspondence course now being offered by the United States Independent Telephone Association to employes of its member companies. In some moderate-sized exchanges, every operator in the office has enrolled for the course.

Telephone managers should give all possible encouragement to their young women who are sufficiently interested in their work to enroll in this course, and this interest should continue to the point of seeing that the young ladies who enroll keep up their work and complete the course.

Many inquiries have been received from non-member companies asking what arrangements they can make to enroll their operators. The method is simple and the expense is small. Any Independent company can join the association by filling out an application blank and paying the nominal membership fee of $5, and thereupon can enroll as many of its operators for the course as it desires.

The association furnishes to each one who enrolls a neat and very durable binder in which to keep the lesson questions as received and in which to file the answers made by the operator, after they have been sent in, graded, and returned to her. The correct answers in printed form are also sent to the operator when her paper is returned to her.

Everyone who satisfactorily completes the course will receive a certificate or diploma setting out that fact. This will be suitable for framing.

Big "Southern" Convention to Be Held Next Week in Atlanta.

The "Southern Independent telephone company" convention to be held at the Henry Grady Hotel in Atlanta, Ga., on Wednesday, Thursday and Friday of next week, May 26, 27 and 28, under the auspices of the Georgia Association of Independent Telephone Companies, is expected to be a memorable meeting.

Invitations to attend the convention having been extended to all Independent telephone companies in Florida, Alabama, Tennessee, North and South Carolina, and Georgia, a large and enthusiastic gathering is anticipated. It is also expected that the most comprehensive exhibit of Independent telephone equipment ever made in the South will be featured at this convention. In order to give the visiting telephone men ample opportunity to inspect the exhibits, the entire first day of the convention has been set aside for this purpose.

Owing to the serious illness of President Wm. R. Bowen of the Georgia association, who is undergoing treatment at a hospital in Baltimore, the convention will be presided over by Vice-President J. M. Dent of Douglas, Ga. The address of welcome will be made by Clifford Walker, governor of Georgia.

Among the other prominent speakers who will address the convention are F. B. MacKinnon of Chicago, president of the United States Independent Telephone Association, who will speak on "The Work of the National Association" and will also discuss individual Independent telephone company problems with company representatives in attendance; C. O. Bickelhaupt, vice-president of the Southern Bell Telephone & Telegraph Co., who will speak on "Service from the Customer's Viewpoint," and C. M. Candler, former chairman of the Georgia Public Service Commission, the subject of whose address is "Public Utility Regulation."

A. C. Cragg, general auditor of the Tri-State Telephone & Telegraph Co., St. Paul, Minn., will speak on "Telephone Accounting"; A. L. Staderman, chief engineer of the Citizens Telephone Co., Terre Haute, Ind., on "Telephone Engineering Standards," and J. Prince Webster, general counsel of the Georgia association, will speak on "The Future of the Independents in Georgia."

One of the features of the convention will be the acceptance of an invitation from the Atlanta Journal for the Independent telephone men of the South to inspect the operation of Broadcasting Station WSB—one of the finest broadcasting stations in the South, located on top of the Biltmore Hotel in Atlanta.

Forty Million Dollars of New England Bell Bonds Offered.

A new issue of $40,000,000 of 4½ per cent bonds of the New England Telephone & Telegraph Co. was offered on May 13 by a nation-wide syndicate headed by J. P. Morgan & Co. The issue matures in 1961 and is priced at 94½. The issue is the largest of the year in the telephone industry and has been exceeded in size only once by a public utility.

The bonds will be issued under the same mortgage under which an outstanding issue of 5 per cent bonds was brought out several years ago. Proceeds will be used for the financing of construction work, both past and future, and to refund advances made by the American Telephone & Telegraph Co.

During the last five years the New England company has earned two and a half times interest charges, including the present issue, and current earnings are three times charges. The company pays dividends of 8 per cent a year on its common stock.

Recommend That Minimum Charge for Directory Be 50 Cents.

The California Independent Telephone Association directors, at their recent meeting, passed a motion recommending to member companies that the minimum charge to non-subscribers for a telephone directory be 50 cents and that the minimum charge for a book containing more than 1,000 names be $1. This motion was passed after President C. A. Rolfe had brought up a discussion on the subject.

Some Lessons Learned from the Past

Reminiscences of the Past and Lessons to Be Learned, Including Those Having Particular Application to the Public, the Regulatory Bodies, the Operating Companies and Manufacturers—Address at the Kansas Convention

By Harry N. Faris,

Telephone Consultant and Technical Engineer, United Telephone & Electric Co., Abilene, Kans.

At our Silver Anniversary convention, one year ago, it was my pleasure to review the inception and growth of the Kansas association. Because of the extensive ground to be covered it was found impractical to depart much from historical narrative and but little attempt was made to draw conclusions from the events recited. So the purpose of this present paper is to see what lessons can be learned, not merely from our 25 years of associated effort, but from the entire 50 years of telephone progress, completed on March 10, with the inaugural of the telephone's semicentennial celebration.

Retrospections, too constantly indulged in, are not always profitable; in fact, some rough speaker has said that when an old timer becomes reminiscent, you might as well "take him out and kill him" as he will spend the rest of his life longing for the "good old days," when things were done so much better than at present and will become a clog to progress in any live organization or in any profession or industry.

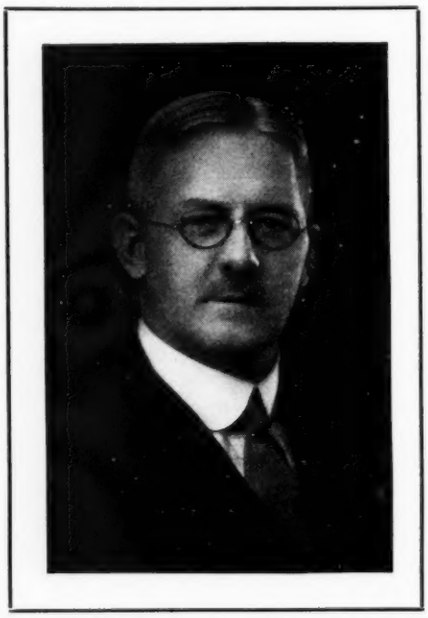
But, at stated intervals, and on occasions like this, it is no waste of time to indulge in a proper amount of retrospection, with a view to profiting therefrom and more wisely mapping our future course. There is no way to judge the future but by the past. In so doing, we can remember that human nature and the laws of economics remain constant and that our real problem is to estimate the probable effect of progress and changing social conditions. It is also highly important that we look outside our own business, for, if our study be so confined, the conclusions reached are sure to be fallacious.

The Romance of Communication Development.

Perhaps the most outstanding lesson is the stability of the communication industry. In fact, the earliest practical application of electricity was the magnetic telegraph of Professor Morse in 1844. Those of us who can hardly hope to see the centennial of the telephone, can look forward to the equally important hundredth anniversary of the telegraph, only 18 years hence.

The smoke signal of the savage and flashing shield of the Graecian warrior were but early expressions of man's urge for the more rapid communication of intelligence. These and other devices of like kind were crude and uncertain. They lacked the all essential element of secrecy and were good only for the limits of visibility. So, when long distance communication was desired, physical transportation of the message was necessary from the creation of man until the invention of the telegraph 82 years ago.

Thus we have such immortal incidents of communication as the Marathon runner, Paul Revere's ride, and the relay of fleet



"There Is No Way to Judge the Future But by the Past," Says Mr. Faris, in Pointing Out the Wisdom, on Occasion, of Indulging in Retrospection.

horses by which the fall of Jerusalem, before the battering rams of the Crusaders, was relayed across Europe.

In more modern times, there is a banking tradition that the foundation of the great Rothschild fortune was due to a strategic arrangement, whereby the news of Napoleon's defeat at Waterloo was secretly relayed to Paris and London, more than a day in advance of the general report. The bloody battle of New Orleans was fought unnecessarily six days after the close of the war of 1812 and—as if connecting the ancient past and the modern present—I shall never forget the thrilling night races in which Kansas farm boys, with fleet ponies, vied with one another in carrying township elections returns to the county seat. As an example of the age-old interest in communication, it might be added that the "two-bit" bets, determined by the race, were of more interest than the election bets, settled by the carried returns.

I wonder if we communication folks of today fully appreciate that of the billions of people who have lived before us, and the countless multitudes who may come after us, we are the favored few to witness the passing of these ancient systems and to take part in their replacement by the modern methods of today.

Are we not too prone to overlook the wonder and the romance of these accomplishments, accepting them as commonplace, and failing utterly in the sentiment of Professor Morse, who in transmitting the first instant intelligence of all time, used the reverent words, "What hath God wrought?" and might not this immortal message be taken as a fulfillment of the prayer expressed, more than a thousand years previously, in what is said to be the oldest written sentence of the English language: "O Mother Earth! Be Thou fruitful in God's embrace!"

Is there not too much tendency on our part to become self-centered in the work we happen to be doing and fail to note how the world moves and the progress going on about us? To those of us who, engrossed in our own vocation, thought we were masters of the science of telephony and that there neither was, nor was to be, anything new under the sun, what a shock was the rather sudden advent of radiotelephony. But why should we have been caught napping?

Just as the wire telegraph preceded wire telephony by 32 years, so did wireless telegraphy precede the practical radio telephone by nearly 20 years, and from the historical analogy, so plainly apparent now, we might have known the latter was coming and need not have made ourselves so conspicuous by pronouncing it "impossible" and the earliest reported accomplishment as "bunk," as so many of us did.

Vision Necessary to Progress.

What the next quarter or half century has in store in the way of development is impossible of conjecture. The marvels of radio transmission with its deep impression on the thinking laity has almost produced the belief that, with the occult mysteries of our art, all things are now possible.

At the most recent celebration of Lincoln's birth, I heard a prominent orator and statesman pay a glowing tribute to all whose genius had helped to "make our country over," as regards the comforts of life, since Lincoln's time. Of course, the marvels of radio reserved for his climax

in which he startled us with the statement that nothing seemed longer impossible to science and, although the lips of Abraham Lincoln had been sealed in death for more than 60 years, the vibrations of his Gettysburg address had not yet died away, but having only started on their eternal journey to the outer realms of space, this new-born giant, radio, with waves infinitely more swift than those of sound, was about to bring back to us, not only the Gettysburg speech of 60 years ago, but Washington's Farewell Address and even the Sermon on the Mount, in the words of Christ himself.

A startling vision, indeed, but, so long as man's imagination "pictures forth, the form of things unknown," progress is assured; and not only the "poet's pen" but the inventor's brain will "turn to shapes" and give to many "airy nothings, a local habitation and a name."

Task of Development as Important as Discovery.

While such flights of fancy are necessary to stimulate progress and realize many seeming unattainables, to most of us fall the more humble task of development and application which history proves is often as important, and even more difficult, than discovery itself.

Thus we might, without violence to Joseph Henry, recognize Professor Morse as the real discoverer of electrical intelligence transmission and at the same time give to Professor Bell equal or greater credit for having pushed his researches toward the production of a *"speaking telegraph"* until they reached fruition in the Centennial telephone of 1876.

Any who are inclined to argue that Bell's invention was wholly independent of Morse's foundation, are respectfully referred to the decision of the highest British Court, which after years of investigation, held that the telephone, in its remote reproduction of mechanical movements, was but an improved form of the telegraph. I believe the finding of this court, anciently noted for the accuracy and wisdom of its decisions, can be accepted without detracting in the least from the grandeur of Bell's achievement.

Stability of the Communication Industry.

As already mentioned, perhaps the most outstanding lesson in the art of communication is that *new inventions do not supplant but merely supplement existing systems.* This is important because of the effect on our credit—or on our securities—of the heralding of supposedly new and *supplanting* inventions, and we should take sufficient time to prove that such fears are groundless. With the introduction of the telegraph, postal receipts only quickened their normal rate of growth. While it was once feared that the long distance telephone would scrap the telegraph, the latter business has steadily increased and, of recent years, at a most phenomenal rate.

That the radio will never do more than *supplement* the commercial wire telephone is almost universally conceded, and those of us operating the wire properties of today can allay our fears of total obsolescence, through new and wonderful discoveries, by remembering the analogies cited.

The lessons of the past being so multitudinous as to call for classification, it may be well to divide them, and, in addition those of general nature, already discussed, we may consider, separately, the lessons having particular application to the public, the regulatory bodies, the operating companies and the manufacturers. It will be noted that the public is placed at the head of list; that the regulatory bodies are given their rightful position between the public and the operating companies; and that the manufacturers are placed last, since they are—or at least should be—"the servants of all."

The outstanding lesson to the public, and the one which they must be taught, is the fallacy of local competition. Statistics tell the story both throughout the nation and within the confines of each state. Might it be suggested that a preparation of the true history and final results of local competition would be a profitable undertaking for each state association? The collective results, if published by the national association, would afford a bulletin filled with startling facts and figures, equal in weight and authenticity to those put out by the National Electric Light Association. With the facts of past history truthfully portrayed, it would be as difficult for a community, now free from telephone competition, to "get into the net" as for a well served city, free from light and power competition, to vote and sell bonds for a duplicating plant.

Fallacy of Competition.

Such authentic figures should also serve to show the few communities still afflicted with the local competition the futility of allowing such condition to drift indefinitely and of continuing to take losses while delaying the service unification which must ultimately occur.

Telephone systems exist to serve the public and not to afford somebody a job, and no two companies have a right to continue, at the expense of the public, a competitive warfare, or even to maintain an inactive "army of occupation" which the public has to support. There is always a way out, without any confiscation of property, and, in bringing about a unification, the public interest should be paramount.

Public Interest Paramount.

Delving into ancient history, to determine whether or not the building of the competitive plant was justified, is wholly unprofitable. Most of these "hang-over" competitive plants have been built so long that we might as well assume there was a good reason for their construction, but the advent of state regulation having avoided all necessity for the continuance of competition, the patrons themselves should insist on its removal—and a proper unification of service—since there is no reason why they should support both the competitive situation and the commission created for its avoidance.

The Value of Good Service.

The public has yet to learn the real value of good service. The difference in value of what the service should be and of what it is, in many communities represents an economic loss of staggering amount, which is none the less serious because from a negative source.

Only last summer an instance came to my notice where 3,500 bushels of wheat had been hauled some seven miles over a bad road, instead of three miles over a good road, in the belief that the price at the more remote elevator was three cents higher. This erroneous belief resulted from a "whoop and holler" conversation over a "free service line" between the market where the wheat should have been sold and that to which it was hauled for a final settlement price exactly the same as the home market had offered.

Bad transmission and "free" service are kindred evils and it is not difficult to surmise that the former follows the latter. Furthermore, most free service lines are economic nuisances to the connected communities, and the patrons would be better off without them. The public must yet be brought to appreciate that *cheap service* of *poor quality is the most expensive service* they can have, and that, with respect to "free service," there is no such commodity and that all service rendered must be paid for by somebody.

State Regulation.

One of the greatest political developments of our time has been that of state control public utilities through commissions clothed with delegated legislative authority. The legal status of such bodies has been clearly determined and they are now functioning in all states of this section, except Iowa and Texas, which non-commission states, perhaps, represent the two extremes of telephone rates, with agricultural Iowa at the low end of the scale and "booming" Texas at the top. It would, therefore, appear that the *popular* clamor that commissions never function except to *raise rates*, and that thought of so many *telephone men* that commissions are only interested in *holding rates down*, are both unfair to these bodies.

The fact is that in sections where the rate scale is so low as in Kansas and similar agricultural states, the commission can proceed to advance rates without "kick-back" only as the telephone people themselves do the necessary work to convince their local communities of the need for such increases. In no state where the commission and the utilities have dealt fairly and frankly with each other, and where the utilities have assumed, or rather re-

tained, the burden of justifying rate advances, and have never "passed the buck" to the commission, is there any clamor for a return to the anomalous system of "having the bleachers act as umpire."

Commissions, in my opinion, should avoid any appearance of peremptory action and should be as careful to give reasons for their decisions as are the courts themselves. After getting the facts—from the correct viewpoint—they should act fearlessly, insisting however, on all cooperation from the utiltity in educating the collective public mind to see the justice of the conclusions reached.

A matter of great regret is the short term for which commissioners are usually appointed, or elected, and the general uncertainty of tenure of office of the legal, engineering, and accounting staffs. Where experience is so necessary to the proper discharge of duty, the necessity of "breaking in" a new commissioner, about the time his predecessor becomes fully efficient, is indeed a matter of regret. If commissioners cannot be retained indefinitely, the maintenance of an efficient and slow-changing supporting organization becomes all the more important, and it is hoped that future legislatures will strive to effect such stabilized conditions.

Many operating companies once had the idea that their only duty was to render good service and that the public should then be eager to pay "standard rates" therefor.

Passing of the Manufacturer Promoter.

Failure to realize that the telephone business is "affected with a public interest" was doubtless the underlying cause of many competitive plants, but I believe the more potent reason was the activities of the promoter and of the promoting manufacturer. These people always claimed their mission was only to relieve intolerable conditions and that whatever trouble might come to the occupant company was the latter's fault and the direct result of its own sins.

But knowing that even the best regulated company is likely to have some mud at the bottom of its public relations' pond (and that a part of the job is to keep this mud *at the bottom*) these promoters never failed to sound the pond with a long pole until they felt mud. Then it was an easy matter to stir the whole mass into inky blackness and claim that the only way out was a competitive property.

When not promoting opposition plants, they were seeking to inject strife into what would otherwise have been peaceable developments, and were loading up new organizations with apparatus which the more experienced companies would not buy.

Oratory was their strong point, and I was once forced to overhear a speech which I shall never forget. Not a word in it relative to the kind of telephone system which the community should have or the type of equipment best suited to its needs; instead, a wildly-distorted "history" of the telephone business from the kill-the-octopus, bust-the-trust standpoint, and a wail of warning against playing into the hands of this terrible trust in the selection of their equipment.

They were told it wasn't from choice that I was there to sell them equipment, but in an effort to snatch from the promoting manufacturer his just reward for having broken their shackles and for bringing the blessing of the telephone to every village and farmhouse in the land; also that I was secretly in league with the neighboring company which, for the development of this community, had proposed the outrageous rate of $19 per year, for *eight months* of which proposed rental the promoter would sell the telephone outright, to remain theirs for ever and ever. These good people were also told that but for the perfidy of the powers of darkness, they would have had telephone service 20 years earlier.

Yes, I lost the sale and, had this talented young emancipator stayed on my trail long enough, I would probably have lost my job. Fortunately he discovered a larger field, and I understand he is now successfully promoting insurance companies with the avowed purpose of showing up the extravagance and the sinful waste of the companies already in the field.

Considering the havoc that can be wrought, and the property rights destroyed, by people of this type and the fact that there is nothing to prevent their "orating" their way into Congress, were the "ultra-conservatives" who, at the founding of our government, wanted a life tenure of office for United States senators as well as Supreme Court justices—so very far off? Also, are not those operating companies that think the industry would be better off without public utility commissions, overlooking the credit due such bodies for having made these promoters and social parasites seek other fields? They brought more telephone misery into the world than any other single agency, and their passing is not to be regretted.

Human nature, perhaps, cannot be changed, but people can be so correctly informed that their natural sense of right and justice will have a chance to operate—and this is the combined task in which the utilities and the well-informed regulatory bodies must cooperate.

Individual Ability No Longer Sufficient.

Equal in importance to the maintenance of public relations is the task of keeping intact our internal organization and our physical properties so that proper service can be rendered. Those who depend on good service alone, seem to fall sooner, but those who try to make an extra good job of public relations take the place of real service *fall the harder*. The latter may be likened to any manufacturer who tries to make "high-power salesmanship" take the place of real merit in his proposition.

Personally, I am venturing the suggestion that the telephone business has outgrown individual ability, however great, and that the one-man organization has seen its day. For nearly 30 years I have been in constant touch with Independent properties of all sizes and have had an unusual opportunity to study the methods of the more successful companies, yet I wish to say frankly that I would not consider myself competent to operate a telephone property of my own without the advice and assistance of specialties, in many branches of the work with which I am not sufficiently familiar.

There was a time when the telephone business is said to have had numerous individual prodigies who could do everything that needed doing and settle correctly any question that might come up, but, if these "super-telephone geniuses" ever existed, they have certainly failed to perpetuate their kind. What our business needs today is not brilliant geniuses, but the assurance of *competent* management beyond the lifetime of any individual.

A valuable analogy might here be drawn from the experience of our sister industry of light and power which, though some years younger, has certainly surpassed us in association work.

There was a time when the individual lighting companies tried to hire "all-around" light and power men and to get from the manufacturers whatever engineering and technical service was necessary to enable their "all-around" superintendents and managers to get by. The light and power industry started to "pick up," not with the replacement of small stations by large units and high-tension lines, but with the recognition of the need for the reliable engineering firm to serve all organizations not large enough to maintain such departments for themselves.

The engineers had their scare when it was proposed to make certain service features of the national association take their

"The Spirit of Give and Take"

There doesn't seem to be the same spirit of give and take today as there was 40 to 50 years ago. There never was greater need for right thinking and the development of a spirit of toleration and respect for the rights and opinions of our fellows.

Let's try and bring back the methods and manners of the old-timer who believed in his neighbor and whose troubles were his troubles and whose joys he also shared. Let's exemplify by our acts the spirit of charity and real humanity.—William H. O'Brien, chief of the telephone and telegraph division, Department of Public Utilities of Massachusetts.

places in disseminating general information but, as so often happens, they found themselves more scared than hurt, for the more work that was done by the association the greater was the demand for really special engineering services, all of which more than paid their way in the economies affected.

The thousands of telephone properties scattered throughout the country may present a different problem in detail to that tackled by the electric light association, but fundamentally the telephone situation is now quite similar to that of the light and power industry when thousands of individual properties were trying to "go it on their own" and before the full benefits and possibilities of associated effort—and the necessity for proper management—came to be realized and accepted by all the people in the industry.

Association Must Represent Entire Industry.

Any association can accomplish only what those in the industry desire, and membership support is not sufficient if such membership be not fully representative of the industry. Hindered by non-member "hold-backs" who, knowing that association work is necessary, contribute neither of their means, time nor talents, the association so afflicted may be likened to the sweating and puffing section boss who, in disgust, finally stepped on the brake and announced to the only other occupant of the hand-car: "Be gorra, there's somebody ridin' this car that ain't a-pumpin'."

Let us hope that none of the more poorly-supported associations will have to take such drastic action as to "step on the brake" and bring progress to a stop, in order to get the support to which they are entitled. If everybody will only "pump"—and work like he pumps—we may become able to discard the hand-car and buy a speeder to conserve our energy for the real work of maintenance, but we will never get the speeder until we learn to willingly pump the hand-car.

Lessons for the Manufacturer.

Due to my recent "emancipation" from the manufacturing field, it may not be wholly presumptuous to attempt some comments as to what the supply department of the Independent industry can learn from the past. So before their difficulties become dimmed or obliterated by the work I am now undertaking, I shall venture just a few friendly suggestions to the manufacturing section.

As stated a few moments ago, the manufacturer was classified last because he was —or should be—"the servant of all." Just as the telephone company is created for the patron, and not the patron for the company, so the manufacturer is created for the telephone company and not the utility for the manufacturer. The latter's business is not regulated by a state or federal commission, but, in his field, competition still survives and his business is regulated by the age-old principles of barter and trade. So, as a matter of necessity, the manufacturer must be keenly alive to progress in the industry, and must keep himself in touch with the requirements of his customers in the operating field. The manufacturer who insists on keeping in advance of the procession will meet with disaster almost as quickly as the one who lags behind.

Again, let me say that telephone companies do not exist for the purpose of constantly keeping up with the latest and cleverest creations of the manufacturer, but the latter exists for the purpose of supplying what the *operating companies* need at the point to which *they* have progressed.

Development in the telephone progress of any community should be orderly, and the attempt to go too fast may prove as financially disastrous as unwillingness to progress at all. The maufacturer must, therefore, be very careful in his recommendations to the purchaser who is placing full confidence in factory guidance. The past has seen many bad "spills" as a result of mistakes honestly made by manufacturers who were not sufficiently informed as to the service and commercial problems involved. The extensive changing of any telephone system is always fraught with an element of danger and calls for the closest cooperation of manufacturer and operator if an improvement in service and public relations, fully commensurate with the expenditure made, is to be realized.

Personally, I was always worried with responsibility on finding a customer with no definite ideas of his own but with such childlike confidence in the omniscience of his manufacturer as to think that I should know, off-hand, exactly what he needed, and be able to prescribe, almost without investigation, an equipment that would work out most efficiently and please him and his patrons, his wire chief and chief operator, and both the plant and traffic officials of his long distance company.

Please do not put such a burden of responsibility on your manufacturer, and do not assume that he is all-wise or mistake-proof, for omniscience is a quality I have never seen, either in the operating or manufacturing fields.

In addition to getting the necessary traffic data, I always insisted on learning all I could about the plant conditions and the ideas of maintenance prevailing where the equipment was to be used. Likewise I wanted to know the "race, color and previous conditions of servitude" and the "equipment religions" of the several people responsible for results. With such a line-up, I could usually prescribe an equipment fully efficient and a layout that would please. But all this takes time, and since delays and discussions are dangerous, the policy of too many sales managers, harassed by heavy quotas, is to not "stir up the animals" with investigations and discussions but to "get the business."

So don't ask your manufacturer to assume all responsibility for the proper selection and engineering of your equipment. Do your full part and if you are not yet familiar with the type of equipment you seem to require, by all means call in some one to act for you and insist on having your measure properly taken before the cloth is cut.

Proper Engineering, Not "High-Powered Salesmanship."

Because of the relation of confidence that must exist between the Independent company and its manufacturer, it is plainly apparent that the so-called "high-powered salesmanship" should have no place in telephone equipment purchases, and the manufacturer who turns loose on the industry the "high-powered" salesman, who is not also well-informed and conscientious, is riding for a fall.

So long as sales strategy remains a more important factor than sound engineering and equipment merit, so long will the purchase of equipment remain a precarious procedure. High-powered salesmanship generally needs curbing, since the outstanding economists of today are agreed that it is one of the most dangerous elements in our national business structure.

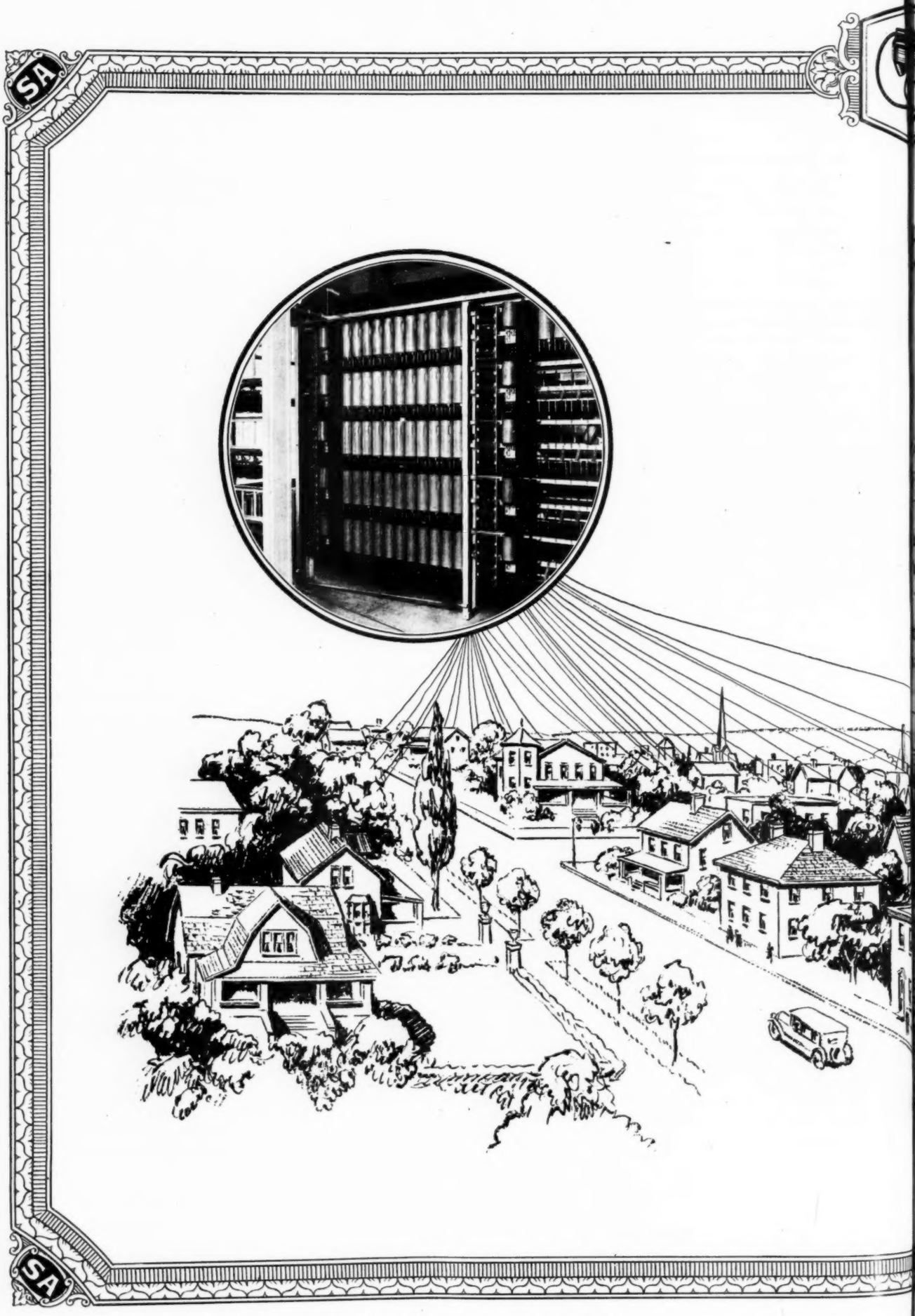
The Independent operating companies can congratulate themselves on the remarkably direct and efficient methods of marketing telephone equipment that have grown up with the industry. It behooves the Independent manufacturer to keep such marketing methods simple and direct with sales and distribution costs at the absolute minimum, bearing ever in mind that the enormous equipment purchases of the Bell companies are made practically without

(*Continued on page 23.*)

Constant Discoveries in Science Are Needed.

The great discoveries of science in the past have belonged to no particular nation. Every country has contributed to all civilization; Germany in chemistry, England with the steam engine, America with the telephone, electric light and airplane. Every nation has made its fundamental contribution to all we live by.

Today we could not carry on without constant discoveries. The reason why the theories of Malthus did not prove correct in practice was that he did not take science into account. We can support another 100,000,000 people in the United States, if we make discoveries in proportion with their numbers.—Herbert Hoover, Secretary of Commerce, before Pan-American Congress of Journalists.



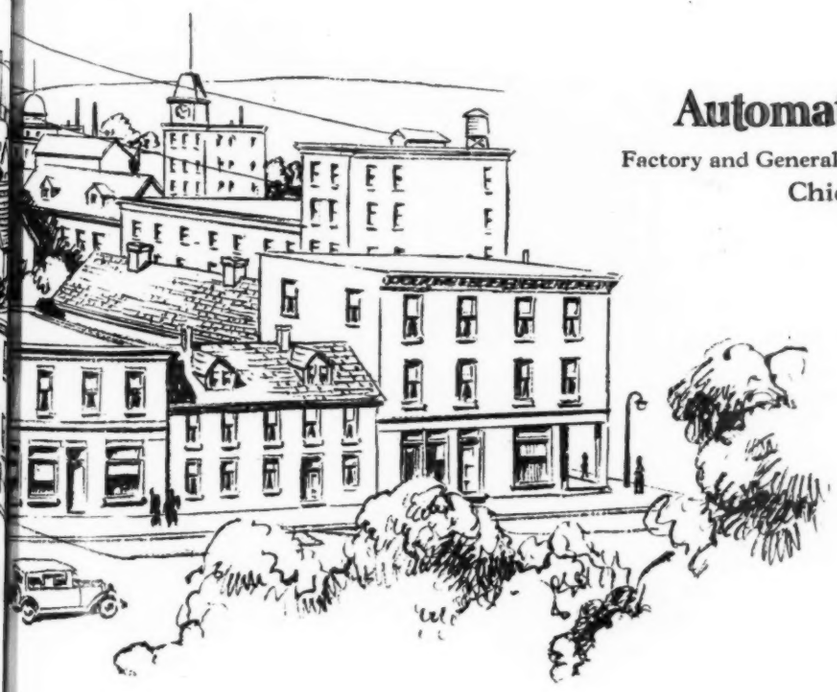
rowger Automatic Equipment Economical ~

Because It Fosters Growth

A significant feature of Strowger Automatic equipment is the ual saturation of the areas served.

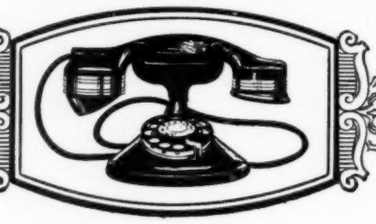
This is not mere accident or coincidence. It is the result of the lar appreciation of quick, accurate and reliable service. Tele- e users depend on the telephone and use it at every opportunity.

Telephone companies, like other business organizations, to prosper expand. Strowger Automatic equipment makes telephone anges grow.



Automatic Electric Inc.

Factory and General Offices: 1033 W. Van Buren St.
Chicago, U. S. A.

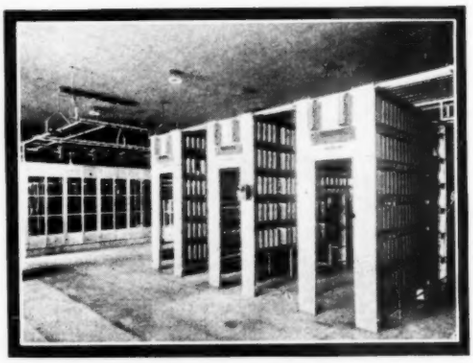


A New Era of Telephone Service Begins For

Mankato, Minn.

ONE of the largest and most progressive telephone operating companies in Minnesota is the Mankato Citizens Telephone Company, of which Mr. P. M. Ferguson is manager.

To insure a continuance of its prosperity and to give its subscribers the benefit of the most modern service, this company has decided to replace its present central office equipment with Strowger Automatic. Orders have accordingly been entered with Automatic Electric Inc. for a 2800-line Strowger Automatic switchboard.



A Typical Single Office Strowger Automatic Exchange. Capacity 2,800 Lines.

Automatic Electric Inc.

CHICAGO, U. S. A.

When writing to Automatic Electric Inc., please mention TELEPHONY.

(*Continued from page* 19.)

sales expense and that the Independent company must compete with the Bell companies as to investment and operating costs.

In former times, when growth was rapid, the equipment manufacturer could afford to call on even the smallest exchanges quite frequently, but since these same plants have approached the saturation point and so require apparatus for maintenance purposes only, the volume of such business no longer justifies regular calls, and the manufacturer continuing such calls is doing so at the expense of his larger and more important customers.

This indicates a problem now up for solution. I can only suggest that if these smaller companies, who need frequent assistance, are to be called on regularly, it can only be done without loss to the manufacturers by their going to a combined sales-and-service policy and charging such companies a fair price for services actually rendered. The present policy of frequent calls and gratuitous service, in return for low-profit supply business, is unsound. The larger Independent companies, that install and maintain their extensive equipment purchases, without manufacturer assistance, will not always continue to pay for services rendered the smaller companies on equipment purchased on the same price basis.

In the foregoing we have but scratched the surface as to the lessons that might be drawn from past experience. In conclusion, I would only refer you to my talk of a year ago in which I called attention to the fact that "the old order changeth" and that the methods which in times past have enabled many of the smaller companies to drift along and "get by" will no longer suffice. The problem of the Independent industry, as Mr. MacKinnon has so often said, is that of men and management; and when proper management is assured—not merely for the uncertain lifetime of a single individual, but permanently—the new capital so vitally necessary for additions and betterments will then become available.

Individualism Belongs to the Past.

Individualism, although well suited to pioneer development conditions, has almost served its day and, according to my best observation and belief, it is no longer able to cope with modern costs and the growing complications of our business. The solution of this question is up to the industry itself. As I have previously stated, when good management is already available it should be extended in scope; and, in making our business what it should be, there are indeed few who should not either extend help to others or with equal willingness receive and accept help for themselves.

All this, to the end that our sacred trust may be fulfilled and our properties made the self-perpetuating servants of the public rather than a temporary means of livelihood for ourselves.

Changes in Staff of the Northwestern Bell Telephone Co.

The American Telephone & Telegraph Co. has recently drafted into its service three Northwestern Bell men, W. A. Wencel, traveling auditor, C. B. Smythe, directory and sales supervisor, and H. H. Gay, general supervisor of plant methods and results. Each will be attached to departments in New York that carry on the same lines of work they have been following with the Northwestern Bell Telephone Co.

George Knauler, general supervisor of outside plant at Omaha, succeeds Mr. Gay, and L. H. Redfels takes Mr. Smythe's place.

A. L. Sypult, manager of the Northwestern Bell at Minden, Neb., has been made district plant chief clerk at Norfolk. C. E. Weinhardt, division revenue accountant at Des Moines, has been drafted for supervisor of methods in the auditor's office, succeeding J. J. Higgins, appointed last month as treasurer. Frank H. Raine of Holdrege, has been named as manager at Trenton, Neb.

Walter Thorgrimson, assistant general commercial agent at Omaha, has been transferred to the Iowa division of the Northwestern Bell Telephone Co. Mr. Thorgrimson was commercial engineer for the Lincoln Telephone & Telegraph Co. for a number of years. N. W. Kingsley, interference engineer in the chief engineer's department at Omaha, has been made general plant employment supervisor. V. M. Hall, manager of Pender, Neb., has been transferred to Oakland, where he takes charge of affairs.

Cut in 4½% Charge Affects A. T. & T. Co. Income.

The reduction in the service fee charged subsidiary telephone companies by the American Telephone & Telegraph Co., from 4½ to 4 per cent, is believed chiefly responsible for the reduction of the parent company's earnings for the month of March and the first quarter of this year. The March gross totaled $7,189,743, compared with $7,079,792 for the same month last year, while operating income dropped to $1,960,760, compared with $3,239,163 last year. For the first quarter, gross totaled $22,937,412, against $20,612,378, and operating income $9,186,171, compared with $9,353,197.

Prices in the Metal Markets.

New York, May 17—Copper—Quiet; electrolytic spot and futures, 13⅞@14c. Tin—Easy; spot and nearby, $62.00; futures, $59.00. Iron—Steady; No. 1 northern, $22.00@23.00; No. 2 northern, $21.00@22.00; No. 2 southern, $22.00@23.00. Lead—Quiet; spot, 7.75@7.80c. Zinc—Firmer; East St. Louis, spot and futures, 6.85@6.95c.

THE WORD BRIDGE

By Miss Anne Barnes,

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa

One morning, a few months ago, when coming up Main street, over at Hocum, I paused to look back at a fine team of gray horses, whose sleek bodies bespoke good food and care. Their master, a healthy, rugged-looking young farmer, drove leisurely along as though he had not a care in the world.

"Sitting on top of the world," I thought as I passed on up the street and met the chief operator, who had observed me turn and look back at the farmer and his gray team. She told me he was one of the most prosperous young farmers in the community.

Undoubtedly, I would have soon forgotten the incident, but it flashed vividly back to memory when I received a letter from her a few weeks later telling me that this young farmer had taken his own life, later on that same day that we had watched him make his way leisurely up the street. She said no one had ever suspected that he had a care in the world.

I thought: "How little we realize the sorrows and tragedies in the lives of those with whom we touch elbows, in street cars, theatres, churches, everywhere."

How little you operators, at your Centrals all over the world, realize your possibilities for doing *good,* along with your speedy and accurate service, by putting your *personality* across space, over that *bridge of words,* to your patrons.

You do not know, when the little lights flicker, or the shutters drop on your switchboards, the sorrows and heartaches back of those signals—loneliness sorrows, grief sorrows, tragedy sorrows.

Remember, words and phrases are the bridges over which your voice travels. These words are dead and meaningless until you kindle them into life with your personality.

What the Commissions Are Doing

Up-to-the-Minute News Regarding the Activities of State and Interstate Commissions, Courts and City Councils in Matters Concerning Telephone Companies—Summary of Commission Orders and Schedule of Telephone Hearings

To Review Order to Install Telechronometer in Everett.

Upon application of J. C. Taylor, Ellen Steifvoter and 50 other plaintiffs, telephone patrons of Everett, Wash., writ of review returnable at 1:30 Monday, May 24, was recently issued by Judge J. M. Wilson of the Thurston county superior court of the order of the Washington Department of Public Works, directing the Puget Sound Telephone Co. to install the telechronometer throughout the city of Everett. It is alleged that this order of the department, issued March 31, 1926, is void, unlawful, arbitrary and unreasonable. It is charged that no opportunity was given at the hearing to complainants to offer evidence to contest the feasibility, practicability or accuracy of the telechronometer; that, nevertheless, the department found the device to be scientifically sound in principle.

It is further claimed that the monthly charge for unlimited service was more fair, just and reasonable, and that the department's order was discriminatory against Everett. It is denied that a majority of the telephone users desired metered service; complaint is made of the "ready-to-serve" charge and reference is made to a petition of nearly 3,000 patrons protesting against installation of the telechronometer.

It is asked that the order of the department be reversed and reasonable rates ordered.

New Rates for Auburn and Niantic Telephone Companies.

Revised telephone rates for Auburn and Niantic were announced in orders of the Illinois Commerce Commission made public May 6. The original applications of the Auburn Telephone Co. and the Niantic Telephone Co. were canceled on the ground they were unreasonable and new schedules were fixed by the commission.

The order of the commission says that evidence shows the valuation of the Auburn company in 1925 to be $59,700. The new schedule of annual rates follows:

Individual line, business, $36; two-party line, business, $30; individual line, residence, $27; four-party line, residence, $21; rural residence service, $21.

The company is ordered to install within 60 days new modern and up-to-date equipment.

The value of the Niantic plant was placed at $16,728.

The revised annual rates for this exchange are as follows:

Individual line, business, $33; two-party line, business, $27; individual line, residence, $24; four-party line, residence, $21; rural residence, $21; service station, $10.40.

Astoria (Ill.) Telephone Co. Gets Increase in Rates.

The Illinois Commerce Commission, on May 5, authorized the Astoria Telephone Co. to increase its rates for telephone service at Astoria, Ill., and vicinity so as to provide a 7 per cent return on an $18,000 investment. It is estimated that the new rates, which will increase local rates 25 cents per month and rural rates $2.50 per year, will add $2,145 to the company's yearly income.

Rates Increase for Union City (Ind.) Telephone Co.

The Union City Telephone Co., of Union City, Ind., was recently given permission by the Indiana Public Service Commission to place in effect a new rate schedule providing for increases ranging from 41 to 59 per cent over the old rates. The company operates in Randolph county, Ind., and also in adjoining territory in Ohio.

The commission fixed the value of the company's Indiana property—which constitutes 62 per cent of its entire property—at $128,840, for rate-making purposes. It was estimated that the new rates would yield revenues of $30,990, as compared with $21,469 under the old rates. The new schedule of monthly rates follows:

Single line business	$3.75
Two-party business	3.25
Single line residence	2.50
Two-party residence	2.00
Four-party residence	1.75
Rural party line business	2.50
Rural party line residence	1.50

Carl H. Mote, of the law firm of Mote & Goodrich presented the telephone company's case before the commission.

Judgment for Injury by Falling Telephone Pole Upheld.

The Kentucky Court of Appeals recently affirmed the decision of the lower court which in the case of the Paducah Home Telephone & Telegraph Co. vs. Carmen, 281 S. W. 478, entered a judgment for $554 for personal injuries sustained when one of the poles of the appellant broke, on account of its rotten condition, and injured the driver of a passing truck.

The opinion of the court of appeals follows in part:

"The court instructed the jury, in substance, that if they believed from the evidence that appellant negligently maintained the pole in such a dangerous condition that the street was not reasonably safe for public travel, and that by reason thereof the pole fell across the street, and as the direct and natural result thereof the truck driven by appellee collided with the pole and appellee was thereby injured, they should find for appellee. It is insisted that appellant's liability should have been made to turn on whether it failed to exercise ordinary care to keep its poles in good condition, and that the instruction did not submit this issue. Doubtless it is the better practice in cases of this character to instruct as contended by appellant; but where, as here, the instruction submits the issue of negligent maintenance, and defines negligence as the failure to exercise ordinary care, its legal effect is substantially the same, and it cannot be said that the instruction is erroneous. Indeed, a similar instruction was approved in Burton v. Cumberland Telephone & Telegraph Co. (Ky.), 118 S. W. 287.

This is not a case where a pole in sound condition was suddenly knocked or thrown down and the company had no opportunity to discover that fact, but a case where the pole fell because of its rotten condition, which the exercise of ordinary care would have revealed in time to prevent the accident."

Scotia Company Seeks to Buy 18 Missouri Exchanges.

Permission to purchase and operate five telephone companies, including exchanges in 18 Missouri towns, is asked by the Scotia Telephone Co., of St. Louis, in an application filed recently with the Missouri Public Service Commission. The value of the companies is listed at $230,000.

The companies involved and the price listed for each were given as follows:

Commercial Telephone Co., operating exchanges at Washington, Union, Mehlville, Fenton, Afton, Imperial and Pevely, $108,000.

Advance Telephone Co., operating exchanges at Advance, Purico, Marble Hill and Luteville, $44,000.

Eldon Telephone Co., with exchanges at Eldon, Etterville and Barnett, $26,600.

Versailles Telephone Co., operating exchanges at Versailles and Stover, $21,000.

Festus Telephone Co., with exchanges at Festus and Crystal City, $30,000.

The Scotia Telephone Co. also asks au-

(*Please turn to page* 28.)

Can an Appraisal Be "Too Good?"

Occasionally a property owner raises the question of whether an appraisal can be "too good." The question arises because provable appraisal service costs more than that in which there is an element of opinion or guesswork.

The American Appraisal Company operates on the principle that an appraisal cannot be "too good"—that the making of an appraisal entails a moral responsibility which cannot be overestimated.

The record of The American Appraisal Company for the past thirty years offers abundant testimony of the soundness of this principle. For whatever purpose, rate making, accounting, finance, purchase or sale, and many others, an appraisal cannot be too good.

The American Appraisal Co.

MILWAUKEE

PUBLIC UTILITIES - INDUSTRIALS - REAL ESTATE PROPERTIES - NATURAL RESOURCES

A NATIONAL ORGANIZATION

When writing American Appraisal Co., please mention TELEPHONY.

Here and There in Telephone Work

Pacific Bell Provides Entertainment for Original Patrons.

The first telephone directory published in San Francisco, Calif., was dated June 1, 1878, the number of names appearing therein totalling 179. On March 10, 1926, the Pacific Telephone & Telegraph Co. provided a unique program of entertainment for such of those original customers who could be located and who were able to attend.

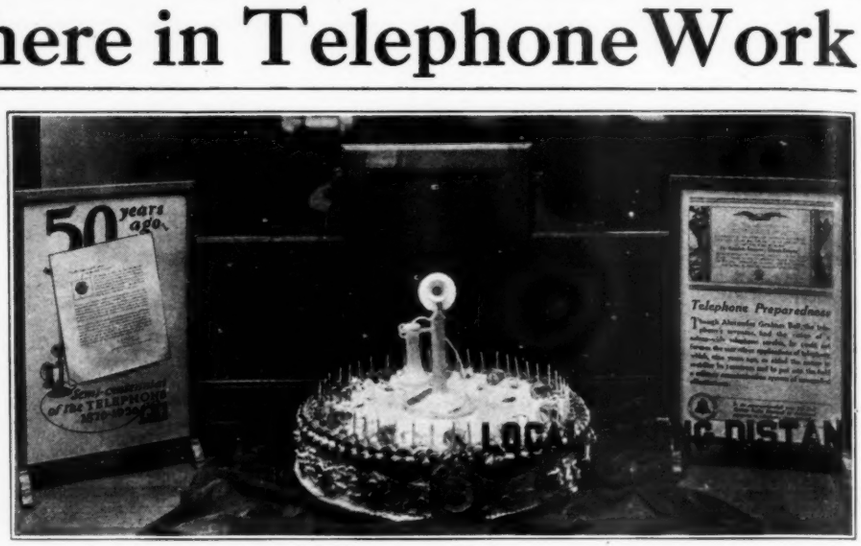
An interesting method was employed in locating the surviving members. The first directory was checked against the current directory and a letter addressed to those whose names appeared in both directories; letters were also written to certain public officials. Enclosed with the letter was a copy of the first directory. Thirty-five such letters were written on December 19, 1925, and responses received from 11 by letter and three by personal call. A second letter was addressed on January 14, 1926, to 21 of those customers who did not respond to the first letter. Seven replies were received to this letter.

Replica of San Francisco's First Exchange and W. H. Torpey and J. B. Leonard, Who Operated the Exchange in 1878.

Subsequently it was decided to have a representative make a complete investigation of every customer listed in the first directory in an effort to locate additional survivors. A search was also made for surviving employes and former employes. This investigation enabled the company to locate two surviving customers, three surviving employes and two surviving former employes.

The activity was well worth while. By the letters and personal visits of the company's representatives, much good will was created. This was particularly noticeable in the calls of the company's representative.

He was courteously received and in practically every case involving a firm, discussed the program with an executive who displayed great interest.



The Telephone's Birthday Cake Displayed in Window of Pacific Telephone & Telegraph Co. in San Francisco on March 10.

The meeting of surviving customers and employes was very impressive and the general spirt of cooperation of those who attended a fine thing to observe. It was also gratifying to observe the general willingness to participate on the part of other concerns who did not have surviving employes. This phase of the semi-centennial program was a success and contributed materially to the furtherance of better publice relations.

Present at the program of the Pacific Telephone & Telegraph Co. were three surviving individual customers: Mrs. John I. Sabin, wife of former president John I. Sabin; J. H. McMenomy, butcher in the California Market in 1878 and still at the same location; Dr. J. P. Trumpour, a dentist in 1878 and still practicing.

The firms represented by employes who were in their service in 1878 were: Wells Fargo Bank, represented by Harry Hanley and W. F. Hess and California Cracker Co., now the American Biscuit Co., by Adolph Grantz and Louis Moran.

Employes and former employes of telephone company who were in the service in 1878, included: J. B. Leonard, operator in 1878, now P. B. X. maintenance man; W. H. Torpey, operator in 1878, now retired; Wm. Delabanty, lineman in 1878, now in engine room in Graystone office; Howard Keyser, messenger telegraph operator in 1878, now in right-of-way division.

These survivors gathered in the office of T. F. Delury, district manager on March 10, and introductions made where necessary. A number of those present had been friends and acquaintances in the past and had not seen each other in years because of divergent paths in life.

Perhaps the most interesting feature of the semi-centenial program of the Pacific company was the pioneer celebration in which old timers were the principal actors. This took place in the assembly hall of the new telephone building on New Montgomery street and was attended by approximately 500 people.

In the center of the stage was built a replica of the first exchange used in San Francisco in 1878. This exchange was op-

Guests of Honor at Pacific Telephone & Telegraph Co.'s Golden Anniversary Celebration in San Francisco. Standing, from Left to Right: Adolph Grantz, Louis Moran, H. I. Solomon, Harry Hanley. Seated, from Left to Right: J. H. McMenomy, Mrs. John I. Sabin, Thos. F. Delury, Dr. J. P. Trumpour and W. F. Hess.

erated by two men who were exchange operators on the board in 1878, W. H. Torpey and J. B. Leonard.

To the left was built a living room which was a replica of the living room in the home of Mr. and Mrs. John I Sabin in 1878. Mrs. Sabin wearing a dress 100 year old (which had been worn by her mother) sat in a chair sewing.

On the other side of the stage was built a replica of the butcher shop operated by J. H. McMenomy in 1878 in the California Market. Mr. McMenomy wearing his costume of 1878, which included a plug hat (all master butchers wore plug hats while at work in those early days, and Mr. McMenomy still does this when at work in his market) was in charge of this replica.

Miss Jessie Rees, an employe of the telephone company, was dressed up as the daughter of Mrs. Sabin.

Suddenly Miss Rees remembers that it

AMERICAN
Speaking Telephone Company
OFFICES
222 SANSOME STREET 26 KEARNY STREET 833 SUTTER STREET
965 MISSION STREET TWENTIETH and MISSION HAYES and LAGUNA
CALIFORNIA and FILLMORE POWELL and UNION BUTCHERTOWN
TELEPHONES RENTED AND LINES CONSTRUCTED
LIST OF SUBSCRIBERS JUNE 1, 1878

San Francisco's First Telephone Directory, Consisting of a Card Listing Some 160 Subscribers.

is almost dinner time and that her mother has not ordered meat for dinner. She reminds her mother, who decided to use the telephone (that had just been installed in her home a short time before). She removes the receiver and asks for the McMenomy meat market, when one of the operators of the replica of the first switchboard makes the proper connection and rings the McMenomy meat market which is answered by Mr. McMenomy. An interesting conversation is held, finishing with the order for the meat.

After the conversation Mr. Richard (Dick) Jose, a world-renowned singer of old songs such as "Silver Threads Among the Gold" and "When You and I Were Young Maggie" enters the meat market and engages Mr. McMenomy in conversation asking what that new thing is that is hanging on the wall. McMenomy informs him that it is a telephone and states that he had just talked with Mrs. Sabin. Mr. McMenomy then asks Joe to sing one of the latest songs and he responds by singing "Silver Threads Among the Gold."

The sketch was called "As Was In Beginning" and those attending were members of the George S. Ladd chapter of the Telephone Pioneers of America.

A. T. & T. Radio Branch Now "Broadcasting Co. of America."

Effective May 15, the radio broadcasting activities heretofore carried on by the radio broadcasting department of the American Telephone & Telegraph Co., under the general designation of WEAF, were incorporated under the name of "Broadcasting Co. of America."

This step, it is announced was made desirable by the growth in these activities and by the fact that the problems involved are of a special nature. These problems differ from those of regular telephone operation and can, therefore, be more effectively handled by a separate organization. This corporation, owned entirely by the American Telephone & Telegraph Co., will continue the same general policies as those obtaining heretofore in conducting these activities.

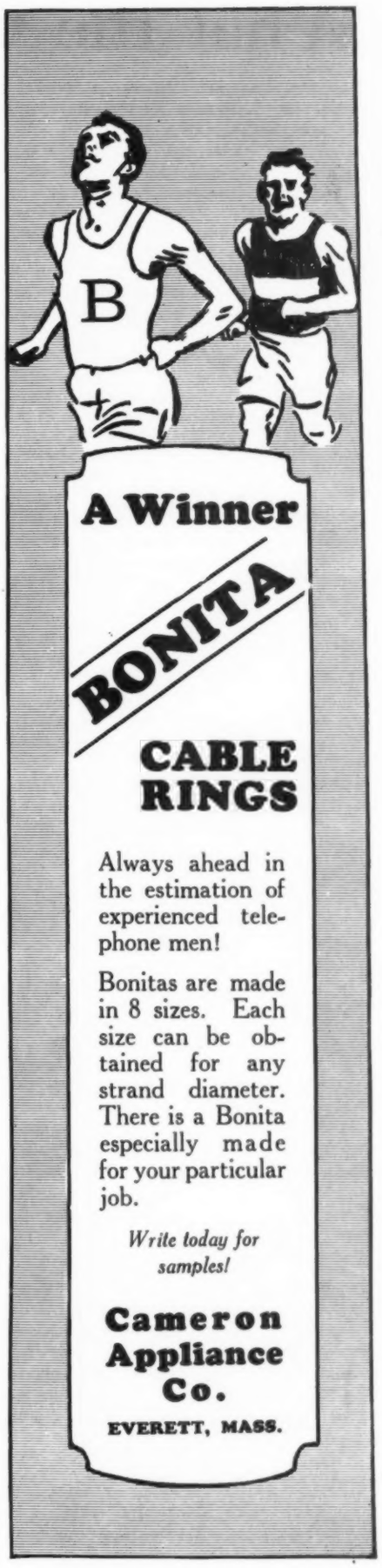
The personnel of this new company will be chiefly made up of the present WEAF organization, and this personnel will continue to direct its efforts toward enlarging and strengthening its standing with the listening public by constantly seeking out for development all that is best in the art of radio broadcasting.

The general plan of operation of WEAF and of connecting broadcasting stations together throughout the country will be followed, as at present, for the purpose of broadcasting simultaneously from these stations programs of entertainment, educational matter and other features.

Australia Shows Greater Growth in Country Than Cities.

The annual report of the Postmaster-General of Australia shows that the telephone service working cost, for the 12 months ended June 30, 1925, was £3,128,913, and the total revenue was £3,661,110, leaving a gross surplus of £532,196. Interest charges, however, exceeded that amount by £258,619, which represented a loss on the year's working.

Capital expenditure, says the Australian Electrical Times, was approximately £4,000,000. Arbitration awards imposed an extra burden of £144,000, in wages during the year, in which 14,379 new telephone subscribers were connected in the metropolitan areas, and 20,301 in country districts.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Write today for samples!
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EVERETT, MASS.

What the Commissions Are Doing

thority to issue $54,000 common and $75,000 preferred stock to be used in making the proposed acquisitions.

E. J. Bean, attorney, St. Louis, a former member of the public service commission, filed the application.

Women on Party Lines With Business Concerns Cause Trouble.

Women of East Helena, Mont., consumed so much time in a conversation over the telephone lines that the business of that community was interfered with. This was revealed in the answer to the filing several weeks ago of a complaint by the Helena Commercial Club with the Montana Public Service Commission against the Mountain States Telephone & Telegraph Co., alleging unsatisfactory service.

The matter was taken up with the telephone company by the commission and resulted in an investigation by the company officials. From this it was ascertained, according to a letter from State Manager Whittinghill, that the only complaint was that "some women who had residence lines on the same line with business houses, held the lines too long." It was also found that two or three residence lines had one or two more subscribers than should have been placed on the service.

The company has, since the investigation, regrouped the business telephones and provided an additional line to unburden some of the overloaded lines, thus taking care of the trouble complained of and to the satisfaction of the commercial club.

Base Rate Area Charges Include Omaha Suburbs.

The Northwestern Bell Telephone Co. has announced a reduction in charges for three large territorial areas in the suburbs of Omaha, Neb. The city has been growing rapidly, and the Happy Hollow, West Lawn Hill and West Brook additions have been built up so compactly that the company feels justified in giving the residents the benefits of the base rate area charges.

This means that their rates will be based on the assumption that they are politically a part of the city, and will be the same for all classes of service as in the older portions of the city. This is done by eliminating the additional mileage charges. By reason of this extension of the base rate area, telephone users beyond who are charged mileage from the base rate area boundary will also secure reduced rates.

Rules Against Free Service to Nebraska Municipalities.

The Nebraska State Railway Commission has ruled that no telephone company can be permitted, under the law, to

(Continued from page 24.)

furnish free service to any municipality.

The matter was brought to the attention of the commission by Secretary Charles A. Patterson of the Arapahoe company. The company has a telephone in the Arapahoe city hall, and the council meets every two weeks. During its session the instrument is used, but at other times it is little employed.

The city fathers don't want to pay for so restricted a service, but neither do they wish to dispense with the telephone. They argued that, as the city had given the company a free franchise, it should reciprocate by giving free service. Mr. Patterson conveyed the request of the council to the commission, which rules that under the law no free service can be given to any person execept employes whose duties require them to be thus supplied.

Sale of Kirtland (Ohio) Company to Bell Approved by I. C. C.

Purchase of the properties of the Kirtland Telephone Co. by the Ohio Bell Telephone Co. for the agreed consideration of $2,500 was approved by the Interstate Commerce Commission on April 12.

The Kirtland company owns and operates a telephone exchange in the unincorporated village of Kirtland, Lake county, Ohio, and vicinity, from which it serves 196 subscriber stations. The Ohio company does not maintain an exchange at Kirtland and no question of duplicated facilities is presented. The exchange of the Kirtland company is located in close proximity to the Wickliffe, Willoughby, and Mentor exchanges of the Ohio company and the four exchanges are in territory suburban to the metropolitan area of the city of Cleveland.

It appears from the evidence that many Cleveland business men have purchased land and built palatial residences within the Kirtland exchange area; that this has resulted in a demand for better and additional telephone facilities, and a quality of service which the Kirtland company is unable to provide; and that for that reason the Kirtland company opened negotiations for the sale of its properties to the Ohio company, which is able and willing to furnish adequate toll and exchange service.

Increased Rates for Cedar City and Parawan, Utah, Approved.

The Mountain States Telephone & Telegraph Co.'s application for permission to increase its rates at Cedar City and Parawan was approved by the Utah Public Utilities Commission on April 12.

The commission found that on or about September 1, 1923, the applicant had purchased the entire physical property of the Iron County Telephone Co., and since that date had operated telephone exchanges at Cedar City and Parawan, and that immediately after the purchase the following rates were placed in effect at each exchange: Business, individual line, $39 per year, two-party line, $27, multi-party line, $18, extension stations, $9; residence, individual line, $27, two-party line, $21, multi-party line, $15, extension stations, $6; rural, business and residence multi-party line, $21; a discount of 25 cents from the main station rates to be allowed if accounts were paid on or before the 15th day of each month.

The commission further found that for the purpose of improving the telephone service at these exchanges, the applicant had expended approximately $70,000 in the way of betterments and additions; that the proposed rates as filed by the applicant were practically the same as those in effect at other exchanges operated by the applicant, in the state, of similar size having similar conditions affecting the furnishing of service; that by placing in effect the proposed rates, the discrepancy between the rates now being charged at Cedar City and Parawan and the rates charged for similar service in similar localities in the state would be relieved; that the rates proposed were necessary and reasonable and should be approved.

The schedules as approved, follow:

Cedar City: Business, individual line, $48 per year, two-party line, $42, extension stations, $12; residence, individual line, $27, four-party line, $21, extension stations, $6; rural business multi-party line, within six miles from central office, $48; residence rural multi-party line, within six miles from central office, $24; $3 per annum for each additional three miles or fraction thereof over six miles.

Parawan: Business, individual line, $42 per year, two-party line, $36, extension stations, $12; residence, individual line, $24, four-party line, $18, extension stations, $6; rural business multi-party line, within six miles from central office, $48; rural residence multi-party line, within six miles from central office, $24; $3 per annum for each additional three miles or fraction thereof over six miles.

Telephone Companies Ordered to Effect Physical Connection.

Physical connection between the lines of the Chesapeake & Potomac Telephone Co. of Virginia and the Valley Local Telephone Co. at Stephens City, Frederick county, to be effected not later than June 1, was ordered recently by the Virginia Corporation Commission.

The commission ordered further that the subscribers of the Valley Local Telephone Co. pay to the Chesapeake & Potomac Co.

a toll of 10 cents per call for service from Stephens City to Winchester, and, in event a toll in the future should be placed on the subscribers of the Chesapeake & Potomac Co. for service from Stephens to Winchester, the toll of 10 cents established for the subscribers of the Valley Local will be increased automatically by the amount of the toll charged to subscribers of the Chesapeake & Potomac Co.

Bluefield Company Denied Rate Increase; Minor Adjustments.

The West Virginia Public Service Commission, on April 24, denied increases in exchange rates asked by the Bluefield Telephone Co., of Bluefield, W. Va., affecting about 7,000 subscribers in Mercer and McDowell counties, West Virginia, and Tazewell county, Virginia.

The commission did permit some readjustments in rates, however, particularly in toll rates. Under the new toll rates for distances between four and eight miles a 10-cent rate for the first three minutes, with three cents for each additional minute on station-to-station calls and a 15-cent rate with five cents for each additional minute was permitted. For longer distances the rates increase five cents for each step of eight miles. A report charge, an innovation in the company's rate schedule, also was allowed.

The tariffs filed by the company, which were cancelled by the order, were estimated to produce an additional revenue of about $38,000 a year, but the few readjustments permitted were not expected to add but a few hundred dollars to the company's income.

Chairman Divine of the commission filed a dissenting opinion in which he expressed a belief that the company was entitled to a greater return. The majority report, written by Commissioner Nethken, found $990,000 as a valuation for the rate-making purposes, and cut down the depreciation allowance to four per cent, holding that 5.97 per cent asked by the company was far above the actual cost in experiment.

Rate Increase for Odd Telephone Co. of West Virginia.

The Odd Telephone Co. was authorized by the West Virginia Public Service Commission, on April 29, to place in effect the following increased rates for telephone service in Raleigh and Mercer counties:

Business, individual line, $3.50 per month, four-party line, $3; residence, individual line, $2.50, four-party line, $2.*

Rural business, $2.50; residence, $1.75. On complaint of subscribers, the commission ordered the company to reduce the number of rural patrons on a line to 12 or less. Until this is done, the old rates for rural service are to remain in effect.

Removal charges: Outside removals, $3.50; inside removals, $1.50; inside extensions, $1.50; outside extensions, $2.

*The base rate area is within a radius of one mile from the switchboard. Outside this area a mileage charge of 75 cents per quarter mile for individual line service and 25 cents for four-party service is authorized.

Delton (Wis.) Telephone Co. Gets Increase in Rates.

The Delton Telephone Co., of Delton, was authorized by the Wisconsin Railroad Commission on April 30 to increase its rates for telephone service from $12 per year for exchange service and $5 per year for switching service to the following schedule of net monthly rates:

Business, one-party	$2.00
Business, two-party	1.75
Residence, one-party	1.75
Residence, two-party	1.50
Residence, four-party	1.25
Multi-party, rural service	1.25

Summer resort service, $12 per season, payable in advance.

These rates apply to grounded lines only. Service on metallic lines is 50 cents per month in excess of these rates. Grounded lines are to take the metallic rate when and as lines are made metallic.

The Delton company serves 47 local subscribers in Delton and 70 rural subscribers in the territory contiguous to Delton. Free service is given patrons to Reedsburg and Kilbourn over trunk lines.

Summary of Commission Rulings and Schedule of Hearings.

CALIFORNIA.

May 11: Willard F. Smith, owner of Capay Valley Telephone System, which furnishes telephone service to the towns of Rumsey, Guinda, Tancred, Brooks and Capay, applied for authority to increase rates for multi-party telephone service from $1.00 to $1.25 per month and additional charge of 10 cents per month for desk or "grabaphone" sets.

ILLINOIS.

April 10: Order issued cancelling and annulling resuspension order affecting rate schedule Ill. C. C. 2, filed by the Hudson Telephone Co., authorizing the company to set aside monthly, as a reserve for depreciation of plant and equipment, $26 plus 6 per cent annually, of all additions to plant and equipment on and after July 15, 1925; also authorizing company to place in effect schedule of rates Ill. C. C. 2, for telephone service in Hudson, McLean county and vicinity.

April 10: Order cancelling and annulling resuspension order affecting rate schedule Ill. C. C. 1, of the Sweetwater Telephone Co.; also authorizing the company to set aside monthly, as a reserve for depreciation of plant and equipment, $25 plus 6 per cent annually of all additions to plant and equipment on and after March 1, 1926; also authorizing company to place in effect schedule of rates Ill. C. C. 1, for telephone service in Sweetwater, Menard county, and vicinity, effective May 1, 1926.

April 10: Order issued suspending until August 13, 1926, proposed rates for telephone service in Wassbach and vicinity, stated in rate schedule Ill. C. C. 1, of the Jo Daviess County Mutual Telephone Co.

Telephone Properties

PURCHASED OR SOLD

Confidential Commissions
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231 S. La Salle St. Chicago, Illinois

April 21: Order denying petition of Ellis Coffey, et al, to withdraw as subscriber to service of the Coles County Telephone & Telegraph Co. in Edgar county and subscribe for service of the Westfield Telephone & Telegraph Co., and dismissing proceedings herein.

April 21: Order suspending until August 26, 1926, proposed rates for telephone service in Odell, Livingston county, stated in rate schedule Ill. C. C. 4, of the Odell Telephone Co.

April 21: Order approving lease by the Chicago Northwestern Railway Co. to the Illinois Bell Telephone Co., of certain land in Peoria, described in order, for five years from February 22, 1926, at $180 per year.

April 27: Order cancelling and annulling rate schedule Ill. C. C. 1, of the Astoria Telephone Co., and authorizing company to place in effect schedule of rates to be designated Ill. C. C. 2, for telephone service in Astoria, Fulton county.

April 27: Order authorizing the Illinois Bell Telephone Co. to sell, and the Kinloch-Bloomington Telephone Co. to purchase, certain toll line property in Bloomington and vicinity, for the consideration of $705.88.

April 27: Order authorizing the Illinois Bell Telephone Co. to sell, and the Minier Mutual Telephone Co. to purchase, certain toll line property in the vicinity of Minier, Ill., for the consideration of $2,438.02.

April 27: Order permanently cancelling and annulling rate schedule Ill. C. C. 2, of the Streator Telephone Co., and authorizing company to place in effect as of May 1, 1926, schedule of rates to be designated Ill. C. C. 3, for telephone service in the city of Streator, La Salle county and vicinity.

April 27: Order permanently cancelling and annulling rate schedule Ill. C. C. 4, of the Automatic Home Telephone Co., and authorizing company to place in effect, as of May 1, 1926, schedule of rates to be designated Ill. C. C. 5, for telephone rates in the city of Pontiac, Livingston county and vicinity.

April 29: Order cancelling and annulling rate schedule Ill. C. C. 2 and 3, of the National Telephone & Electric Co., and permitting the company to file a schedule of rates for telephone service in Farmer City, Weldon, Kenny, Mansfield and Waynesville and vicinity.

April 29: Order cancelling and annulling rate schedule Ill. C. C. 3, of the Niantic Telephone Co., and permitting the company to file schedule of rates for telephone service in the village of Niantic, Macon county and vicinity.

April 29: Order cancelling and annulling rate schedule Ill. C. C. 3, of the Peoples Telephone Co., and permitting the company to file a modified schedule of rates for telephone service in the city of Chillicothe, Peoria county and vicinity.

April 29: Order cancelling and annulling rate schedule Ill. C. C. 2, of the Washington Home Telephone Co., and authorizing the company to file a modified schedule for telephone service in Washington and vicinity.

April 29: Order cancelling and annulling rate schedule Ill. C. C. 4, of the Auburn Telephone Co., and permitting the company to file a modified schedule of rates for telephone service in the village of Auburn and vicinity.

April 29: Order suspending until August 28, 1926, proposed rates for telephone service in Macon, Macon county, stated in rate schedule Ill. C. C. 1, of the State Center Telephone Co.

May 5: The commission granted an increase in rates to the Astoria Telephone Co., of Astoria.

May 6: The commission fixed new rate schedules for the Auburn Telephone Co., of Auburn, and the Niantic Telephone Co. of Niantic.

May 18: Hearing at Springfield in the matter of petition of Illinois Southern Telephone Co. for an order requiring W. S. Terry, doing business as Goreville Telephone Co. to enter into an intercorporate contract with petitioner covering connections between lines from Goreville to Marion and Vienna, Williamson county.

May 18: Hearing at Springfield in the case of the Illinois Commerce Commission, on its own motion, vs. the Chesterfield Telephone Co. and the Illinois Central Telephone Co. in the matter of citation to show cause for delay on the part of the Chesterfield Telephone Co. in reestablishing telephone service in the several towns served by and to show cause for failure of both companies to rebuild line for the purpose of restoring free toll service from Chesterfield to Carlinville, Ill.

May 18: Hearing at Springfield in the matter of proposed advance in rates for telephone service in Georgetown, Westville, Catlin, Fairmont, Fithian, Indianola, Oakwood and Ridgefarm in Vermilion county, stated in rate schedules Ill. C. C. No. 1 and Ill. C. C. No. 3, filed by the Vermilion County Telephone Co.

Petition for rehearing filed by villages of Indianola, Catlin, Westville, Ridgefarm, Fithian, Oakwood and Vermilion County Farm Bureau.

May 18: Hearing at Springfield in the matter of proposed advance in rates for telephone service in East St. Louis and Tri-City in St. Clair and Madison counties, stated in rate schedules IPUC No. 10, 4th revised sheet No. 1, and 6th revised sheet No. 2, and IPUC 11, 5th revised sheets 1 and 2, filed by the Southwestern Bell Telephone Co.

May 18: Hearing at Springfield in the matter of proposed advance in rates for telephone service in Lexington and vicinity, county of McLean, stated in rate schedule Ill. C. C. No. 2 of the Lexington Home Telephone Co.

May 19: Hearing at Springfield in the matter of complain relative to invasion of rural territory of the Palmyra Telephone Co. by the Modesto Telephone Co. near Palmyra, Macoupin county.

May 19: Hearing at Springfield in the matter of proposed advance in rates for telephone service in Sweetwater, county of Menard, stated in rate schedule Ill. C. C. No. 1, of the Sweetwater Telephone Co.; also in the matter of proposed reduced rates for telephone service in Sweetwater, as stated in rate schedule Ill. C. C. No. 2, of the Sweetwater Telephone Co.

May 19: Hearing at Springfield in the matter of proposed advance in rates for telephone service in Roseville, county of Warren, stated in rate schedule Ill. C. C. No. 3, of the Roseville Telephone Co.

May 19: Hearing at Springfield in the matter of proposed advance in rates for telephone service in Groveland, Morton and Tremont, stated in rate schedule Ill. C. C. No. 3, of the Farmers Mutual Telephone Co. of Tazewell county.

May 20: Hearing at Springfield in the matter of proposed advance in rates for telephone toll service from all exchanges and toll stations of the Pike County Telephone Co. in Pike county. Protest filed by subscribers and patrons of Pittsfield and vicinity.

May 20: Hearing at Springfield in the matter of proposed advance in rates for telephone service in Hull, New Canton, Pleasant Hill, Milton, Rockport, Perry, Pearl, Nebo, Bayliss, Griggsville, Barry and Pittsfield, in Pike county, stated in rate schedule Ill. C. C. 2, 3 and 5. Protest filed by patrons and subscribers of the Pike County Telephone Co.

June 15: Hearing on application of the Illinois Southern Telephone Co. for permission to increase its rates, postponed to this date from May 11.

KANSAS.

April 14: The commission authorized the Meridian Telephone Co. to issue 500 shares of common stock of no par value, but having an estimated value of $12,500 and 500 shares of preferred stock of the par value of $100 per share, bearing cumulative dividends at the rate of 7 per cent per annum, but having no voting power; the no par common stock to be sold at not less than $25 per share and the preferred stock to be sold at not less than 90 per cent of the par value, $45,000 of the proceeds from the sale of the stock to be used for the purchase of properties, and $12,500 to be used in paying for betterments and improvements to the property and for working capital.

April 16: In the matter of the application of the Olsburg Telephone Exchange for permission to abandon free service between Olsburg and Riley, the commission, without comment, authorized applicant to abandon free service between these points and to establish a toll charge of 15 cents per message for five minutes, and a charge of five cents per minute for overtime.

MINNESOTA.

May 26: Hearing at Knapp in the matter of the application of the Knapp Telephone Co. for authority to change its schedule of telephone rates.

May 27: Hearing at Norwood in the matter of the application of the Carver County Telephone Co. for authority to change its schedule of telephone rates.

May 27: Hearing at Waconia on the application of the Carver County Telephone Co. for permission to increase its rates at its Norwood, Chaska and Waconia exchanges.

MISSOURI.

May 5: Application filed by the Scotia Telephone Co., of St. Louis, for permission to purchase the Commercial Telephone Co., the Advance Telephone Co., the Eldon Telephone Co., the Versailles Telephone Co. and the Festus Telephone Co., operating exchanges in 18 Missouri towns. Permission is also asked by the Scotia company to issue $54,000 common and $75,000 preferred stock.

NEBRASKA.

May 10: Complaint filed by Bristow Commercial Club that Northwestern Bell Telephone Co. is discriminating against town patrons and in favor of rural patrons in matter of toll charges to adjacent towns.

May 12: Application filed by Cortland Telephone Co. for authority to increase all classes of rates, as present schedule is unreasonably low and results in insufficient revenue to take care of all plant and capital obligations.

May 12: Complaint filed by Frank Thiel, of Pierce, against Pierce Telephone Co. declaring to be unjust and unfair the classification as a business station of the telephone in his home, where family consists of but two members, merely because he operates a small dairy and occasional orders for cream and milk are sent in by telephone.

May 13: Complaint filed by C. B. Vestal, of Irvington, alleging that the

Northwestern Bell company is making unreasonable application of the rule that the gross rate will apply if bill for current month is not paid by the 15th day of such month. He says he sends in his check on the 14th and that the fact that the company does not get it till several days later ought not to rob him of his discount, especially when his good intent has been shown.

May 27: Hearing to be held at Grand Island on protests of business men against elimination of free service with Doniphan, in connection with the application of the Hamilton County Farmers Telephone Association, and the Northwestern Bell Telephone Co. for permission to consolidate their exchanges at Doniphan, the Hamilton County company to operate, and Doniphan to be placed on a toll basis with Bell connecting exchanges.

OHIO.

April 26: The commission authorized the Citizens Telephone Co. to issue its common capital stock in the amount of $5,000 and its 6 per cent preferred capital stock in the amount of $10,000 and sell the stock for the highest price obtainable, but at not less than par, the proceeds arising from the sale to be used to the extent thereof for the reimbursement of applicant's treasury for uncapitalized capital expenditures made therefrom prior to November 30, 1925.

May 25: Resumption of hearing in state-wide rate case of the Ohio Bell Telephone Co. The taking of direct testimony was completed March 31.

OKLAHOMA.

May 20: Hearing in the case of the Kiowa Telephone Co. vs. the Citizens Cooperative Telephone Co., alleging violation of commission's order No. 912.

PENNSYLVANIA.

June 3: Hearing at Erie on protests of the City of Erie and various civic organizations and professional bodies to the increased rates placed in effect April 1 by the Mutual Telephone Co., upon the consolidation of the Bell and Independent plants in that city.

SOUTH CAROLINA.

May 26: Hearing on application of the Southern Bell Telephone & Telegraph Co. for a revision, readjustment and equalization of certain parts of the schedules now in force for toll service.

VIRGINIA.

May 5: The commission ordered a physical connection established between the lines of the Chesapeake & Potomac Telephone Co. and the Valley Local Telephone Co. at Stephens City.

June 2: Green County Mutual Telephone Co., summoned to appear before the commission to show cause why it should not be required to place its lines and facilities in better condition in response to a complaint from Estelle C. Dickinson, of Ruckersville.

June 3: The Citizens Mutual Telephone Co., of Sleepy Creek, the Whitacre Telephone Co., of Whitacre, the South Branch Telephone Co. of Virginia and the Chesapeake & Potomac Telephone Co., have been cited to appear before the commission and show cause why a physical connection should not be made between the lines of the Citizens' Mutual company and those of the Whitacre company, or of the South Branch company.

WEST VIRGINIA.

April 29: The commission authorized the Odd Telephone Co. to increase its rates for telephone service in Raleigh and Mercer counties.

WISCONSIN.

May 11: The commission authorized the Tomahawk Telephone Co. to issue $50,000 par value of its common stock in exchange for all of the business and assets of whatsoever nature of the telephone utility now located in the city of Tomahawk, and also $5.450 of capital stock of the Tomahawk Rural Telephone Co., now owned individually by the several incorporators of the Tomahawk Telephone Co.

May 26: Hearing at Madison on the application of the Green Lake Rural Telephone Co. for permission to dissolve.

June 1: Hearing at Madison on the application of the Shiloh Telephone Co. for permission to dissolve and cease operating.

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Panama Canal Telephone System

Some Unusual Aspects of the Panama Canal Telephone System, Which Was Recently Successfully Cut Over to Strowger Automatic Operation—Present Capacity Approximately 3,000 Lines—Unusual Engineering Problems Solved

By John Wicks,
Development Engineer, Automatic Electric, Inc.

The entire telephone system of the Panama Canal Zone was successfully cut over to Strowger automatic operation on January 23, 1926. The present capacity of the network is approximately 3,000 lines, which are distributed among four offices—Cristobal, Gatun, Pedro Miguel and Balboa—with a small C. A. X. unit at Gamboa and two P. A. X. installations, one at Fort Clayton and the other at Fort Davis.

As administrators of an engineering and military project which easily ranks as one of the greatest achievements of the ages, the Panama Canal Commission in providing equipment for the canal has spared no effort to secure and utilize modern and up-to-date engineering equipment. Besides having one of the largest dry docks in the world, the largest coaling station and immense facilities for oil storage, the Panama Canal now has, through the conversion of its telephone system to Strowger automatic working, modern means of rapidly and accurately effecting telephonic communication. Much of the credit for the improvement must go to W. L. Hersch, electrical engineer for the Panama Canal and C. L. Bleakley, supervisor of telephones for the Panama Canal, who from the start were strongly in favor of the adoption of the automatic system for the Panama Canal telephone network.

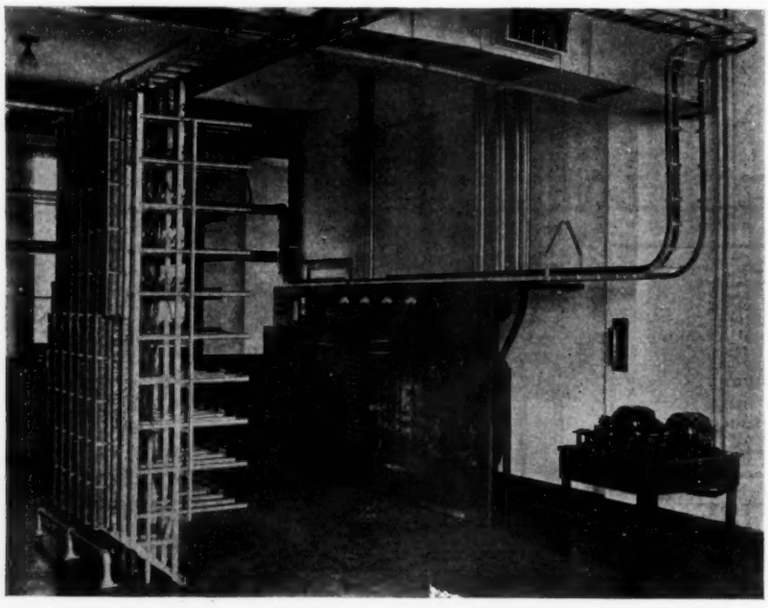
The Cristobal Telephone Exchange, Canal Zone.

Besides having to combat the usual difficulties of insects, heat and humidity common to the tropics, the men responsible for the successful accomplishment of this project had to solve several unusual engineering problems. That these difficulties were successfully met with standard Strowger apparatus—with the exception of a specially-designed repeater circuit—constitutes a great tribute to not only the ingenuity of the engineers, but also to the inherent flexibility and adaptability of Strowger automatic equipment.

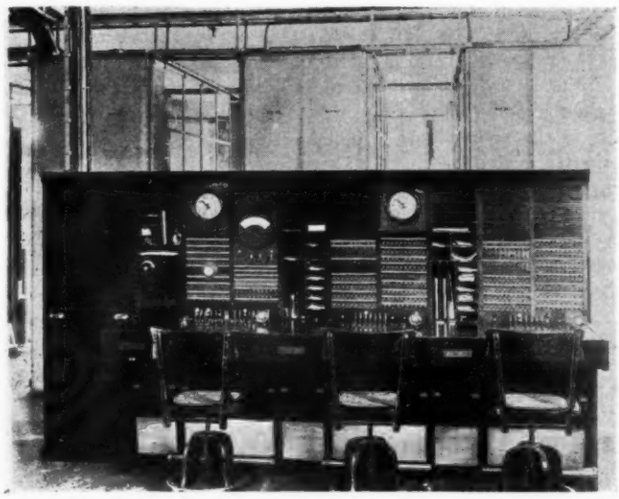
The first difficulties mentioned were met by comparatively slight changes in general construction, which have been followed on previous tropical installations such as Cuba, Hawaii and the Philippines. To prevent insects, particularly ants, from eating wooden parts, all bases, piers, manual cabinets, furniture and everything else constructed of wood, were built of either mahogany or rosewood, neither of which materials is subject to the destructive operations of insects.

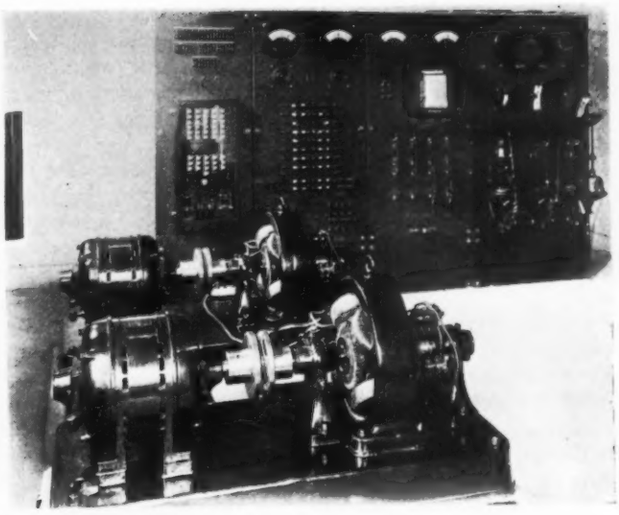
Switchboard wiring was all enamelled and impregnated in a manner customary to installations subjected to conditions of excessive humidity. It was considered necessary to provide an air-conditioning plant for only one of the four main exchanges, namely that at Cristobal. The location of this exchange is somewhat below sea-level, and also adjacent to extensive railway yards, which combined conditions made necessary the air-conditioning apparatus in order to insure the most satisfactory working of the automatic equipment.

The next difficulty, which was successfully solved, had to do with the necessity



Power Board and Main Distributing Frame, Cristobal Exchange.





Remotely Controlled Power Board and Charging Machine, Pedro Miguel Exchange, Canal Zone—Information, Complaint and Test Desk at Cristobal Exchange, Canal Zone.

for dialing over the fairly long distances between the various exchanges, through the quadded and loaded trans-Isthmian cable. Inasmuch as all of the service within the Canal Zone is free of toll charges, the necessity for intercepting calls was done away with, allowing free dialing and talking between any of the various exchanges. Due to the fact that the 50-pair cable connecting the exchanges consisted of quadded and loaded pairs, designed for using phantom circuits, the problem of successfully dialing over these circuits became somewhat complex.

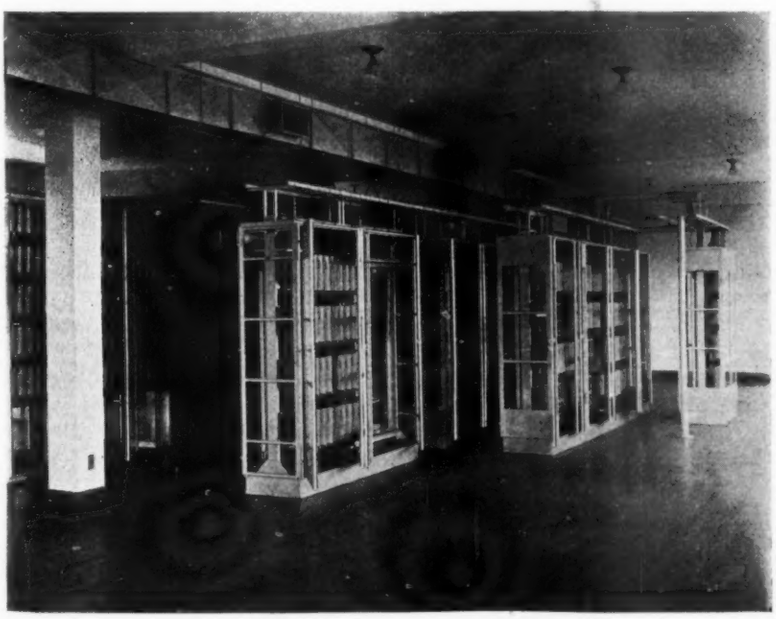
The development department of Automatic Electric Inc. designed the special repeater circuit which is used in dialing and talking over these trunks between offices. The special repeater is required because in this case two cable pairs, or four wires, are used to carry on three telephone conversations at the same time.

The repeater separates the dialing and talking circuits through the trunk cable so that the dialing and supervision for a conversation take place over one wire only. For instance, the dialing for conversation on pair No. 1 takes place over wire No. 1 of that pair, while the dialing for conversation over the phantom circuit takes place over wire No. 2 of the No. 1 pair. Dialing for conversation on pair No. 2 takes place over wire No. 1 of that pair, leaving the No. 2 wire of that pair for use in special signal circuits for use throughout the Canal Zone. In this way every wire in the cable is utilized to the greatest advantage, the importance of which is realized when the great cost and maintenance difficulties of this 50-pair cable are known.

All of the other switches, the selectors, connectors, etc., are standard, since the special requirements for inter-office operation caused by the trans-Isthmiam cable are taken care of by the special repeaters in such a way as not to require any changes in the design or construction of the other switches.

The power equipment in the four main exchanges is designed for what is termed the "full-floating" system of battery operation. This means that a charging machine is floated across the battery at all times, maintaining the voltage constantly at a point high enough above normal not only to prevent discharge but also to replace any losses which might occur in the cells through idleness. This calls for specially-designed compound-wound generators whose voltage curve remains constant when variations in load occur.

The motor-generator charging sets are operated from the power supply taken from the transmission lines running along the railway from the hydro-electric power project at Gatun, which operates during the dry season. The motors of the sets operate on 220-volt, 25-cycle, 3-phase current which is stepped down by transform-

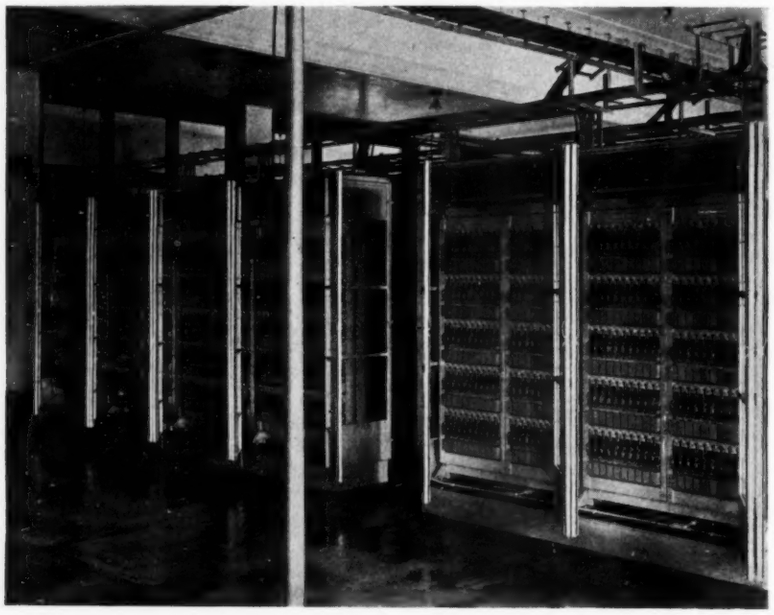


The Automatic Switchroom at Cristobal, Canal Zone.

The Pedro Miguel Exchange.

ers from the high voltage used for transmission. Each office is provided with two motor-generator sets, so that should one set fail for any reason except failure of the power supply, the other can be switched over to assume the load; or if the load becomes more than one machine can handle, both can be switched onto the load.

The ringing machine equipment for each office consists of two motor-generator units, operated from the storage battery current. Each machine is equipped with a commutator type high-speed interrupter with brushes for two tones—a busy tone and a dial tone. In addition, there are six interrupter spring assemblies, for interrupting the circuits to the ringing relays associated with the different primary line switch board groups. The operating cams are so arranged that the spring combinations are operated in rotation, not more than two circuits being closed at one time, thus evenly distributing the load on the ringing machine.



The Automatic Switchroom at the Balboa Exchange, Canal Zone.

An unusual element involved in the operation of the network, was introduced by the fact that two of the four large exchanges were designed to work as unattended exchanges. This meant that, except for occasional visits, the entire operation of these offices would be under the direction of remote control apparatus operated from the nearest attended exchange.

The completed installation is so engineered that Gatun is under the direction of Cristobal, which is located seven miles farther north along the Canal; and Pedro Miguel is remotely controlled by Balboa office, which is about six miles farther south. While these are not the first offices engineered by Automatic Electric Inc. which have been equipped for remote control, they probably represent the most complete and thoroughly developed method of distant supervision and control as yet applied.

All conditions of operation or failure in operation in regard to the charging and ringing sets located in the unattended offices, can be tested for in the controlling exchanges and the various remedial measures carried out by means of the remote control apparatus to be described later.

The two controlling offices of Cristobal and Balboa are equipped with wire chief, information and complaint desks. The remote control relays located in the distant office to be controlled are operated over the test distributor trunk from the controlling office's wire chief's desk. By dialing a special number, the test distributor selects a special test connector, whose banks are specially wired to operate the remote control relays.

In order to make the explanation more clear, let us assume a typical case. For instance, it is desired to test conditions in the Gatun office, and make certain operating changes by means of the remote control apparatus. Since this office is controlled from Cristobal, the operations will be controlled over the test distributor wires from the Cristobal wire chief's desk through the test distributor and special test connector in the Gatun office.

We will assume that ringing machine No. 2 is operating and that it is desired to switch the load to ringing machine No. 1. Figure five is dialed first, which operates the test distributor selector in Cristobal office that connects the test circuit through to a test distributor in Gatun office. The digit three is then dialed on this test distributor, which connects the circuit through to a special test connector that is used exclusively for remote control operations. Next three is dialed on the test connector. This steps the switch up but it does not rotate. One is then dialed, which connects the test circuit through to the first contacts on the third level, that are in turn connected to the ringing generator leads of ringing machine No. 2.

The wire chief can now test to determine whether or not there is anything on these leads. One is dialed again, connecting the circuit through contact 32 to the relay that controls the starting circuit of ringing machine No. 1. By the wire chief grounding the positive test lead the relay is operated and ringing machine No. 1 is started. The dialing of the digit one continues, the sequence of operations being:

(33) Test for ringing generator from ringing machine No. 1.
(34) Test for busy from ringing machine No. 1.
(35) Test for dial tone from ringing machine No. 1.
(36) Switch circuits from ringing machine No. 2 to ringing machine No. 1.
(37) Stop ringing machine No. 2.

By performing the same sequence of operations on the fourth level, the ringing and tone load can be switched from ringing machine No. 1 to ringing machine No. 2 in the same manner. On the second level the following operations take place:

(21) Test voltage of 23 cells.
(22) Test voltage of 26 cells.
(23) Test for voltage alarm.
(24) Test for generator alarm.
(25) Test for fuse alarm.
(26) Test for release alarm.
(27) Test for supervisory alarm.
(28) Test for M. D. F. alarm.
(29) Test for circuit breaker No. 1.
(20) Test for circuit breaker No. 2.

On the fifth level the operation is:

(51) Test for position of circuit breaker No. 1.
(52) Start motor-generator No. 1.
(53) Test voltage of generator No. 1.
(54) Close generator No. 1 circuit breaker.
(55) Test to see that the circuit breaker is closed.
56) Open generator No. 2 circuit breaker.
(57) Stop motor-generator No. 2.
(59) Test position of transfer switch for 23 cells.
(50) Close transfer switch so that 23 cells are in.

By dialing on the sixth level, the same operations are performed for circuit breaker No. 2 and motor-generator No. 2.

The relays in the controlled office which control the circuits to the starters, circuit breakers and transfer switches, are mounted on the supervisory panel. They are in all cases energized by a ground on the positive wire of the test circuit, which is placed on this wire by the wire chief at the distant office. These relays pull up and in turn throw ground on the local control relay circuits.

The relays that control the actual operation of the switches are individual to each piece of apparatus, and are mounted with

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Garford Pony type 4-bar 1600 ohm Bdg. compacts @	8.50
Monarch 4-bar 1000 or 1600 ohm Bdg. compacts @	7.25
Kellogg No. 39 Unbreakable type C. B. desk sets complete with No. 75 straight line steel signal sets @	6.75
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COMPETENT by reason of 14 years' experience, and high school education. Dependable married man now employed desires position with independent company. A hustler and not afraid of work. References furnished. Address 6578, care of TELEPHONY.

POSITION WANTED—By telephone operator; charge of small exchange; nice living rooms for self and little daughter. Good school; permanent. Any state near Kansas. Experienced chief operator; first class references. Address 6581, care of TELEPHONY

WANTED—Job as lineman, troubleman or both. Am 22 years old and experienced and FIRST CLASS in every angle of telephone business, and would expect FIRST CLASS pay. Address 6583, care of TELEPHONY.

Valuation—Supervision—Plant—Inductive Interference
Expert Administrative Counsel for Utilities
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During recent years I have been privileged to appraise Telephone Exchanges all over the United States. The list totals 410. Would you like to avail yourself of my services?
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Can arrange a moderate amount of financing.
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Specialists in Appraisals, Rate Surveys, Financial Investigations, Organization, and Operation of Telephone Companies.
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Telephone System & Accounting Co.
203 West 34th Street
Kansas City, Mo.
W. J. MAROLD, President

it on the power board. In the case of circuit breakers and transfer switches, these consist of high-wound relays whose contacts close the battery circuit to a closing solenoid, or close the circuit to a tripping solenoid. In the case of starters, the closing and tripping solenoids are part of the starters, and their circuits are closed direct from the supervisory panel relays without any intermediate relays.

All offices are equipped with recording ammeters. All trunks are metered, and provision is made so that any particular line can be metered if so desired.

On account of its special engineering features the work of installation presented many unusual difficulties. Much credit for its successful accomplishment must be given J. K. Barrington, installation supervisor for Automatic Electric Inc., who had entire charge of the work of installation for all of the offices.

The completion of the conversion program for the Panama Canal Zone now makes it possible to secure full automatic connections over the entire network. It is anticipated that since most of the business of operation and administration of the Canal is handled by telephone, operations will be speeded up and facilitated considerably by means of the new equipment, and that service to shipping will be thereby improved.

Prizes Offered by Telephone Company for Best Essays.

Cash prizes of $10, $5 and $3 were given by the Chesapeake & Potomac Telephone Co., Lynchburg, Va., for the best essays written on subjects selected and announced by the management. Adult and juvenile competitors were admitted to the contest. The essays had to be one of the following subjects:

"What the Telephone Means to Lynchburg."

"What Impressed Me Most When I Visited the Telephone Company."

"Mutual Obligations of the Telephone Company and Its Patrons in the Interest of Good Service."

The contest was open to any school boy or school girl who visited the telephone central office during visitation week, and who would write a story of his or her impressions on what was seen.

The essays had to be written legibly on one side of the paper, not to exceed 500 words in length. Either one of the three subjects could be picked.

Recent Orders Received for Kellogg Telephone Switchboards.

The Mississippi Valley Telephone Co., of Carthage, Ill., has recently placed an order with the Kellogg Switchboard & Supply Co., of Chicago, for a new four-position, two-section, common battery switchboard.

Contracts have also been received from the International Telephone Co., of Leaksville, N. C., and from the Manteca Telephone Co., of Manteca, Calif., for new three-position universal switchboards.

Gustav Hirsch to Be in His New Offices June 1.

Gustav Hirsch, consulting telephone engineer, announces the removal of his offices from 313 Connor building, to the Interurban Terminal building, Third and Rich streets, Columbus, Ohio, effective June 1.

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In all branches of Telephone Engineering
Rate Cases, Appraisals, Financial Investigations, Inspections and Reports.
COLUMBUS - OHIO

BRUCE V. HILL
Telephone Engineer
Construction — Maintenance—Transmission—Inductive Interference—Special Studies
Member W. S. E.
Fellow Amer. Physical Soc.
1331 Monadnock Blk. Chicago

HELP WANTED

WANTED—Repair Man who is capable of making repairs to all kinds of telephone equipment. Must also be capable of keeping records and handling supplies of company. Good position for man competent to handle the work. First Class References will be required. TWO STATES TELEPHONE COMPANY, Texarkana, Arkansas-Texas.

WANTED TO BUY

WANTED TO BUY—Telephone plant, three hundred to one thousand phones, at once. Address 610 Walnut St., Chilicothe, Mo.